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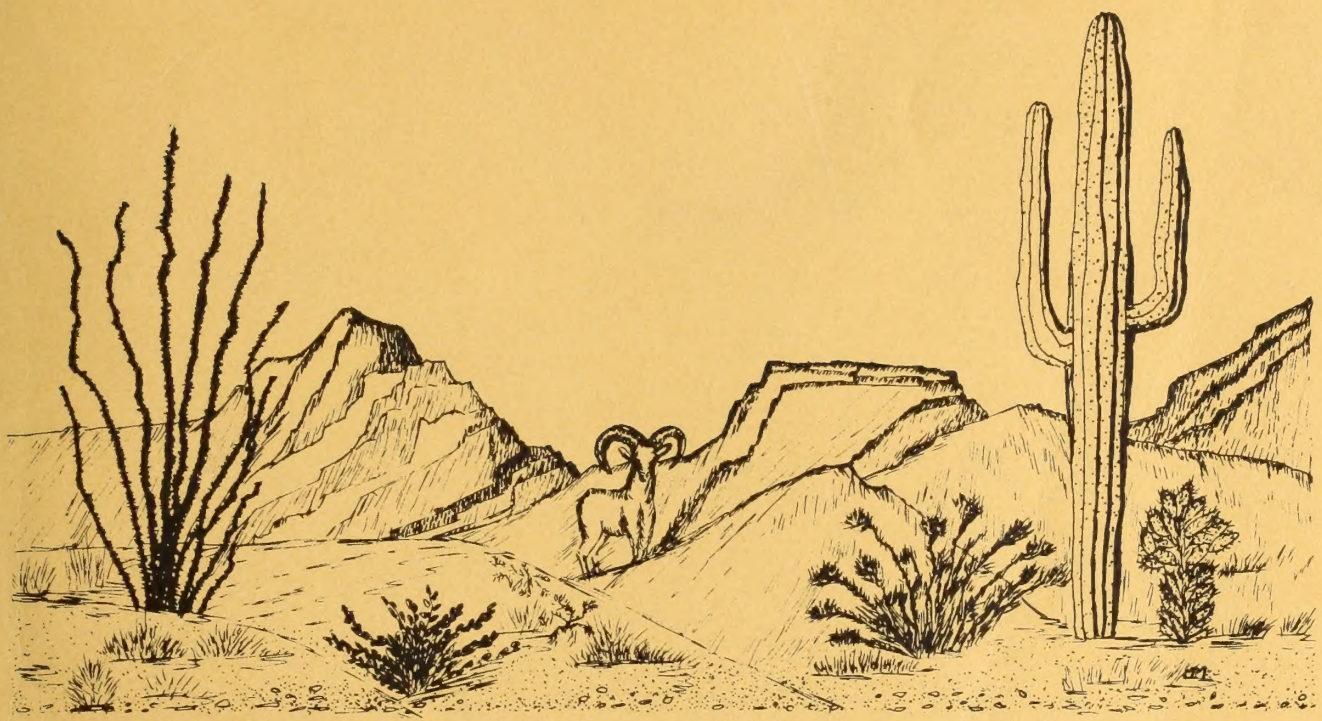
FINAL
ENVIRONMENTAL STATEMENT
PALO VERDE-DEVERS
500KV TRANSMISSION LINE



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BUREAU OF LAND MANAGEMENT
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ARIZONA STATE OFFICE
2400 VALLEY BANK CENTER
PHOENIX, ARIZONA 85073

Enclosed is the Final Environmental Statement for a 500 KV Transmission Line from the Palo Verde Generating Plant, Phoenix, Arizona, to the Devers, California Substation.

The Yuma District of the Bureau of Land Management prepared the environmental statement pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969. The document describes and analyzes impacts which would result from a proposed transmission line, along with alternatives to that plan.

Thank you for your interest in this Environmental Statement.

Sincerely,

Acting State Director

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DEPARTMENT OF THE INTERIOR

FINAL ENVIRONMENTAL STATEMENT

SOUTHERN CALIFORNIA EDISON COMPANY

Proposed

500 kV PALO VERDE-DEVERS POWER TRANSMISSION LINE
PALO VERDE GENERATING PLANT, ARIZONA
TO
DEVERS SUBSTATION, CALIFORNIA

Prepared by:
U.S. Department of the Interior
Bureau of Land Management
Arizona State Office
Phoenix, Arizona

Director, Bureau of Land Management

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SUMMARY

Draft ( ) Final (X) Environmental Statement

Department of the Interior, Bureau of Land Management,
U.S. Nuclear Regulatory Commission

1. Type of Action: Administrative (X) Legislative ( )

2. Brief Description of Action: The proposed action is the construction of a single-circuit 500 kV transmission line from the Palo Verde Nuclear Generating Station near Buckeye, Arizona, to Southern California Edison Company's Devers Substation near Palm Springs, California. The proposed line would cross lands in private and State ownership, Indian Reservations and Federal lands administered by the Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service and U.S. Army, varying between 235 and 265 miles (378-426 km) long, depending on route selected. The proposed action includes upgrading one substation, adding two telecommunication sites and upgrading several others and construction of new access roads as needed.

3. Summary of Environmental Impacts: The proposed action will result in:

   - an increment of damage to the soil and vegetation between 1,742 and 1,915 acres (705-790 ha), depending on route.
   - disruption of wildlife habitat along the length of the transmission line, both directly during construction and indirectly by opening new road access.
   - visual impacts of varying degrees, including visual impacts to between 6 and 10 proposed wilderness study areas and one proposed wilderness area, depending on route.
   - beneficial impacts to the economy of the area and the various taxing jurisdictions.
   - some permanent and some temporary reduction of agricultural productivity along 14 to 22 miles (22-35 km) of the transmission line.

4. Alternatives Considered:

   a. No action
   b. Delay of construction
   c. Upgrading existing transmission lines
   d. New methods of transmission
   e. Limiting consumption of electricity
   f. Alternate routes.

5. Comments Have Been Requested from the Following:

   See attached list. Also, see chapter 9 for comments.

6. Date Statement Made Available to EPA and the Public:

   Draft: August, 1978 Final: February 1979

FEDERAL AGENCIES

Department of the Interior

- Bureau of Reclamation
- Fish and Wildlife Service
- Bureau of Indian Affairs
- Bureau of Mines
- Geological Survey
- National Park Service
- Heritage Conservation and Recreation Service

Department of the Army

- Corps of Engineers
- Yuma Proving Ground

Soil Conservation Service

Environmental Protection Agency

Western Area Power Administration

Federal Aviation Administration

STATE AGENCIES

Department of Economic Planning and Development, State of Arizona (Arizona State Clearinghouse)

Office of the Governor, State of California (California State Clearinghouse)

U.S. NUCLEAR REGULATORY COMMISSION

SUMMARY AND CONCLUSIONS

This Summary and Conclusions section is included in the U.S. Department of the Interior, Bureau of Land Management (DOI-BLM) U.S. Nuclear Regulatory Commission (NRC) Joint Environmental Statement concerning the Palo Verde-Devers 500 kV Transmission Line to represent the NRC's jurisdictional responsibility relative to the construction of the Palo Verde Nuclear Generating Station (PVNGS) Unit Nos. 1, 2 and 3 for which construction permits were issued in May 1976. An Environmental Impact Analysis of a 147-mile transmission corridor from a proposed substation near Williams, Arizona to the Southern California Edison (SCE) Mohave Generating Station in Clark County, Nevada was made as part of the review leading to the issuance of the above permits. However, when the Kaiparowits Project was cancelled, this line was no longer the best route to transmit the power from PVNGS to SCE's Devers Substation near Palm Springs, California. The corridors being evaluated by DOI-BLM in this statement were therefore proposed as possible replacement routes.

This Summary and Conclusions recapitulates and is cumulative for the PVNGS Final Environmental Statement-NUREG 75/078 (FES), the Final Supplemental to the PVNGS FES-NUREG 0036 (FSFES) and the joint NRC-DOI-BLM Environmental Statement. Section references shown in this Summary and Conclusions are only from the NRC's FES and FSFES. Augmentations to the Summary and Conclusions arising from the evaluations contained in the DOI-BLM Environmental Statement are underlined.

This Final Supplement to the Final Environmental Statement was prepared by the U.S. Nuclear Regulatory Commission, Division of Reactor Licensing.

1. This action is administrative.

2. The proposed action is the issuance of construction permits to the Arizona Public Service Company for the construction of the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, Docket Nos. STN 50-528, STN 50-529 and STN 50-530.

The PVNGS, located 15 miles west of Buckeye, Arizona, will employ three identical pressurized water reactors to produce up to 3817 megawatts thermal (MWt) each. A steam turbine generator will use this heat to provide 1280 MWe (net) of electrical power capacity per unit. The assessments contained in this statement were made on the basis of the above power levels. The exhaust steam will be cooled by mechanical-draft cooling towers with makeup water obtained from piped sewage

effluent from the City of Phoenix, Arizona. No cooling system effluents will be discharged from the station.

3. Summary of environmental impact and adverse effects:

a. Preparation of the 3,800-acre site will involve the clearing of up to 2,500 acres of land, 1,500 of which will be permanently devoted to station facilities. An additional 1,200- to 1,300-acre evaporation pond will ultimately be developed during the lifetime of the station. About 2,200 site acres, previously devoted to agriculture, will be excluded from this land use (Sec. 4.1).

b. Soil disturbance during construction of the station, transmission lines, and water conveyance pipeline will tend to promote erosion and increase siltation in local ephemeral water courses. Stringent measures will be taken to minimize these effects (Sec. 4.5).

c. Station, transmission line, and water pipeline construction will kill, remove, displace, or otherwise disturb involved flora and fauna, and will eliminate varying amounts of wildlife breeding, nesting, and forage habitat. These will not be important permanent impacts to the population stability and structure of the involved local ecosystems of the Sonoran desert; however, measures will be taken to minimize such effects as do result from the proposed action (Secs. 4.3 and 4.5).

d. Approximately 110-140 acres of agricultural land will be temporarily affected by construction in transmission corridors depending on the final route chosen between PVNGS and Devers. The great majority can be returned to that use upon completion of construction, thus the impact is considered minor. Similarly, most grazing lands affected along these corridors, as well as along the water pipeline corridor, can eventually be returned to that use. New archaeological resources could be discovered along the path of final transmission corridor alignments. The applicant will take measures to locate and protect such resources if they exist (Sec. 4.1.3 and the transmission line section of this Supplement).

e. The pumping of groundwater will cause a local drawdown of about 1 ft/yr, less than that currently occurring; hence, the impact is considered acceptable (Sec. 4.2.3).

f. Diversion of 91st Avenue sewage treatment plant effluent for station use will result in some degradation of existing downstream riparian habitats along the Gila River during 1984 and 1986, and will decrease water availability below Gillespie Dam where resident populations of the Gila topminnow that were recently stocked there may be

impacted. An expected increase in effluent water availability after 1986 can partially reverse these impacts (Sec. 5.5.1.1).

g. Salt from cooling tower drift could modify floral and faunal species composition on some acreage close to the site boundaries depending upon drift specification selected for cooling towers; however, this is not expected to generally affect the population structure and stability of areas further away (Sec. 5.5.2).

h. The total radiation dose to construction workers is estimated to be 15 man-rem. This dose is a small fraction of the approximately 470 man-rem which will be received by the construction force over the same period from natural background radiation. No significant environmental impacts are anticipated from normal operational releases of radioactive materials.

The upper bound estimate of dose to the public from operation of the plant is 156 man-rem/yr. This is a small fraction of the 21,000,000 man-rems/yr dose that persons living in the United States normally receive from background radiation. The risk associated with accidental radiation exposure will be very low (Table 5.6 and Sec. 7).

i. Station construction and operation are likely to cause some community impacts: Influx of large numbers of construction workers may cause some impact on the Phoenix-area housing market and schools, depending on the pattern of worker relocation; however, an expected excess of both housing units and classroom space will tend to decrease the impacts. The relatively small, permanent station work force will be absorbed with little difficulty (Secs. 4.4.3 and 4.4.4). An increase in local traffic will occur during construction; however, the remoteness of the site and the adequacy of the road system will minimize the impact (Sec. 4.1.5). A decrease in scenic value will result from the location of the station (and its associated transmission system) against the desert surroundings. Sensible air quality is also likely to decrease in the immediate vicinity of the station due to operation of the cooling tower system (Secs. 5.1 and 5.3.2).

4. Principal alternatives considered:

a. Alternative sites

b. Alternative energy sources

c. Purchase of power

d. Alternative heat-dissipation methods

5. The following Federal, State, and local agencies were asked to comment on the Draft Supplement to the Final Environmental Statement issued in November 1975.

- Advisory Council on Historic Preservation
- Department of Agriculture
- Department of the Army, Corps of Engineers
- Department of Commerce
- Department of Health, Education and Welfare
- Department of Housing and Urban Development
- Department of the Interior
- Department of Transportation
- Energy Research and Development Administration
- Environmental Protection Agency
- Federal Power Commission
- Federal Energy Administration
- Arizona Atomic Energy Commission
- Messrs. J. D. Garcia and R. M. Emrick
- Arizona Clean Energy Coalition, Phoenix Branch
- Arizona Friends of the Earth
- Arizona Clean Energy Coalition, Tuscon
- Arizona Wildlife Federation
- Maricopa Audubon Society
- Buckeye Irrigation Co. and Buckeye Water Conservation and Drainage District
- Department of Economic Planning and Development, State of Arizona
- Maricopa Association of Governments
- Maricopa County Board of Supervisors

Comments on the Draft Supplement were received from the following:

- Department of the Interior
- Arizona Public Service Company

6. The Final Environmental Statement was made available to the public, to the Council on Environmental Quality, and to other specified agencies in September 1975.

7. The staff has evaluated the changes in environmental impact caused by replacing the 147-mile corridor previously evaluated (FSFES) with any of the corridors being environmentally analyzed in this document. The staff concludes that the benefits to be derived from the PVNGS project in terms of increased availability of electric power in the applicant's service areas still outweigh the total environmental and other costs resulting from the construction and operation of the station, no matter which of the alternative routings discussed in this joint statement is chosen.

8. On the basis of the analysis and evaluation set forth in this statement, the Final Environmental Statement, and the Final Supplement to the Final Environmental Statement, after weighing the environmental economic, technical, and other benefits of PVNGS, Units 1, 2, and 3 against environmental and other costs and considering available alternatives, it is concluded that the action called for under the National Environmental Policy Act of 1969 (NEPA) and 10 CFR 51 is the issuance of construction permits for the facility subject to the following conditions for the protection of the environment:

a. The applicant shall take the necessary mitigating actions, including adherence to his commitments summarized in Section 4.5.1, and additional staff requirements summarized in Section 4.5.2 of the Environmental Statement, during construction of the Station and associated transmission lines to avoid unnecessary adverse environmental impacts from construction activities.

b. The applicant shall establish a control program which shall include written procedures and instructions to control all construction activities as prescribed herein and shall provide for periodic management audits to determine the adequacy of implementation of environmental conditions. The applicant shall provide a written evaluation of such activities and obtain prior approval of the Director of Reactor Licensing for the activities.

d. If unexpected harmful effects or evidence of serious damage are detected during facility construction, the applicant shall provide to the staff an acceptable analysis of the problem and a plan of action to eliminate or significantly reduce the harmful effects or damage.

e. In addition to the monitoring procedures described in the Environmental Report, with amendments, the staff requirements included in Section 6 of this document shall be followed.

f. If the Kofa Route is approved, no new access roads will be allowed from mileposts 88 to 90.5 (in Yuma Proving Ground).

g. For each 1 acre (0.4 hectare) of known habitat of the Coachella Valley fringe-toed lizard that is permanently occupied, at least 1 acre (0.4 hectare) of suitable habitat is to be purchased in fee title and transferred to the appropriate agency.

h. When final transmission line and water pipeline corridor alignments are chosen, the applicant will be required to provide detailed description and analysis of the routes, prior to the initiation of construction for staff review and approval relating to route acceptability (FES, Sec. 3.8).

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DEVERS SUBSTATION

PALM SPRINGS

Desert Center

Blythe

Quartzsite

TURTLE MOUNTAINS

CACTUS PLAIN

EAGLE MTS

CHOCOLATE MOUNTAINS

PHOENIX

MARICOPA

YUMA

PALO VERDE NUCLEAR GENERATING STATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

ROUTES UNDER STUDY

BRENDA

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SUBALTERNATES (SEE CHAPTER 8)

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MILES

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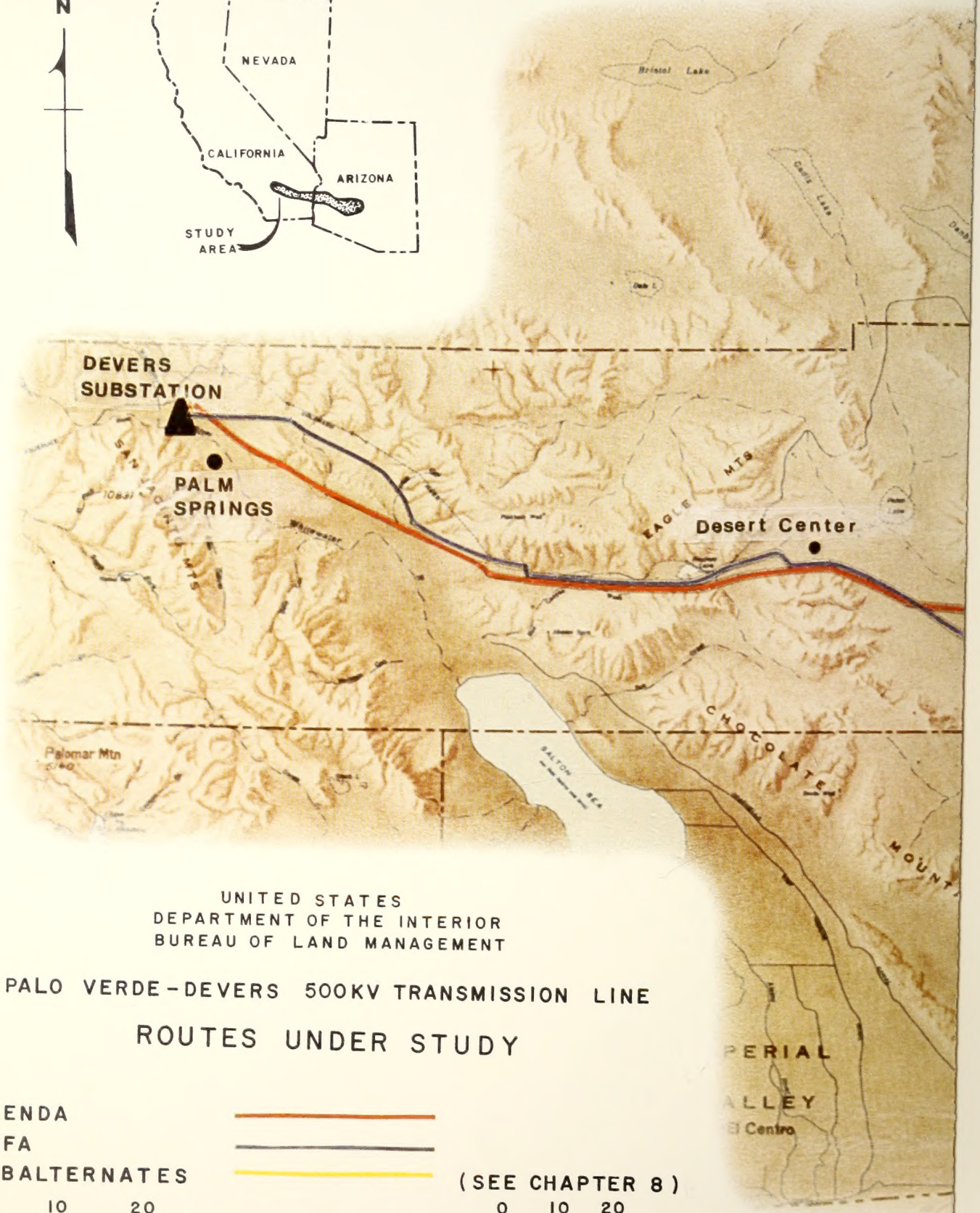
KILOMETERS

MAP O-O



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

ROUTES UNDER STUDY

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SUBALTERNATES

(SEE CHAPTER 8)

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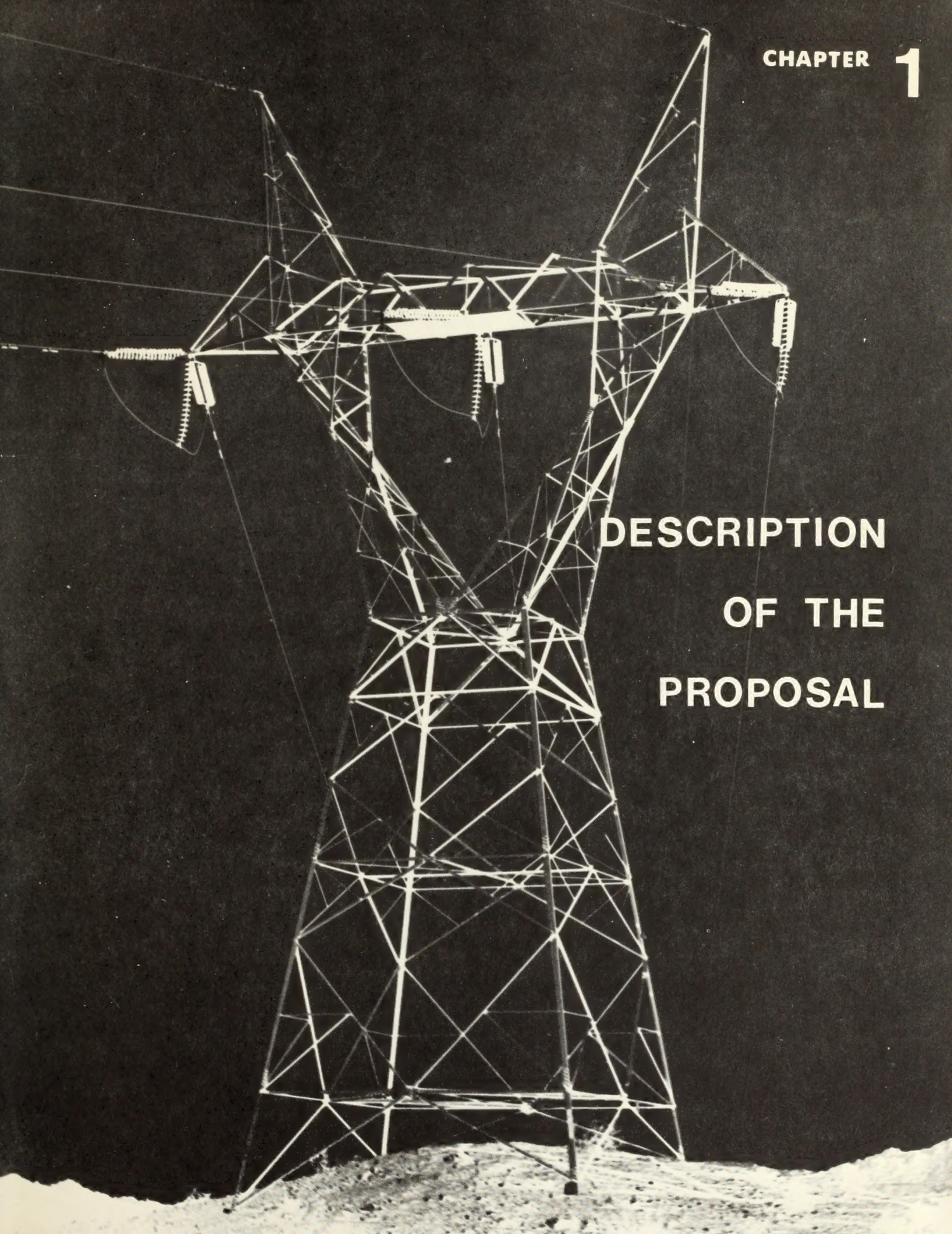


CHAPTER 1

DESCRIPTION OF THE PROPOSAL

CHAPTER I

DESCRIPTION OF THE PROPOSAL

INTRODUCTION

Southern California Edison Company (SCE) has filed applications with the Bureau of Land Management (BLM) for rights-of-way to accommodate construction of a single 500-kilovolt (kV) alternating current (AC) electrical transmission line and ancillary facilities. The purpose of the proposed transmission line is to transmit 585 megawatts (MW), the applicant's entitlement of Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2 and 3 power, to the applicant's Devers Substation. The transmission system is scheduled for completion in January, 1982 (see Fact Sheet, table 1-1).

The proposed right-of-way crosses approximately 235 miles (378 kilometers (km)) of private and public lands (see table 1-1) from the PVNGS, about 40 miles (64 km) west of Phoenix, Arizona, to SCE's Devers Substation, 10 miles (16 km) north of Palm Springs, California. The right-of-way has been requested for 50 years with the right of renewal (Southern California Edison Company's Environmental Report, 1977).

This environmental statement (ES) deals with the applicant's proposed route, one full-length alternative and other short subalternate routes between the PVNGS and the Devers Substation. (See chapter 8 for discussion of discarded alternatives.) It analyzes impacts of construction, operation, maintenance, and abandonment of the transmission system. It also analyzes the impact of ancillary facilities, such as access roads, construction yards and telecommunications sites. Broader questions such as alternate energy sources and needs were addressed in the PVNGS ES issued by the U.S. Nuclear Regulatory Commission (NRC) in September 1975.

SUMMARY OF PERTINENT EVENTS AND FORMAL APPLICATIONS RECEIVED

In October 1975, BLM was notified by letter that the applicant had replaced Tucson Gas and Electric Company as a participant in the PVNGS. The applicant had intended to transmit its entitlement (585 MW) of PVNGS power via the proposed Kaiparowits transmission system. Cancellation of the Kaiparowits Project in April 1976, made it necessary for the applicant to investigate other means of transmitting PVNGS power to the applicant's service area.

TABLE 1-1

FACT SHEET

PALO VERDE-DEVERS 500 KV TRANSMISSION LINE (T/L)

1.	Associated project:	Palo Verde Nuclear Generating Station, three 1,235 megawatt (MW) units.
2.	Circuit scheme:	Construct 500 kV* T/L between new Palo Verde Nuclear Generating Station and existing Devers Substation.
3.	Number of lines:	One single circuit 500 kV
4.	R/W length:	235 miles (378 km*) Brenda Route 237 miles (381 km) Kofa Route
5.	R/W width and tower type:	200 feet (61.0 m*) for freestanding towers, 240 feet (73.2 m) for guyed towers
6.	Nominal tower height:	140 feet (42.7 m) for freestanding towers, 163 feet (49.7 m) for guyed towers
7.	Average span length:	1,600 feet (487 m) for freestanding towers, 1,500 feet (457 m) for guyed towers.
8.	Conductor size and type:	Two conductors per phase, each conductor 1.762 inches (4.5 cm*) in diameter.
9.	Telecommunication site:	Two new facilities adjacent to existing facilities owned by other entities. System also will utilize eight existing communication facilities owned by the applicant or Arizona Public Service Company.
10.	Construction:	Start - July 15, 1980 Completion- December 1, 1981

11. The applicant proposes to build construction yards and concrete batch plants every 25-30 miles (40-48 km) along route. Maximum personnel reporting to each yard shall not exceed 80.

12. Construction Schedule: 16-1/2 months overall

    Maricopa County: 7-15-80 to 5-1-81 (9-1/2 months)
    Yuma County: 10-1-80 to 12-1-81 (14 months)
    Riverside County: 7-15-80 to 12-1-81 (16-1/2 months)

13. Total personnel will be 354, with 177 in each state.

14. Estimated cost based on $324,000 per mile or $201,200 per km

    Brenda Route - $76,140,000
    Kofa Route - $76,788,000

*kV - kilovolt
km - kilometer
m - meter
cm - centimeter

Source: BLM Team

In 1976, the applicant requested and was granted permission to survey potential routes across public lands for the Palo Verde to Devers 500-kV transmission line.

On November 13, 1976, the applicant requested and was denied permission by the Colorado River Tribal Council to conduct an onsite survey through the Colorado River Indian Reservation.

On January 28, 1977, Colorado River Tribal Council notified BLM by letter of action taken by the Council in reference to the meeting with SCE on November 13, 1976.

On January 20, 1977, the applicant submitted to the BLM applications for rights-of-way for the Palo Verde-Devers transmission line under the authority of the Federal Land Policy and Management Act of 1976 (Public Law 94-579).

BUREAU OF LAND MANAGEMENT ACTIONS

The BLM action under consideration in this statement is granting to SCE a right-of-way for the construction and maintenance of the 500-kV electrical power transmission line and ancillary facilities. Prior to decision to approve, disapprove, or defer granting the right-of-way, the BLM has prepared this environmental statement pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA). If the resulting decision is to approve granting the right-of-way and a corridor is selected, detailed negotiations will be conducted with the applicant to finalize the centerline location within the corridor and, formally issue the right-of-way grant.

OTHER AUTHORIZING ACTIONS

FEDERAL AGENCIES

Army Corps of Engineers	Grants river crossing permits and acts as real estate agency for the Department of Defense.
Bureau of Indian Affairs	Issues permits to cross Indian lands.
Department of the Army	Kofa Route crosses the Yuma Proving Ground, which would require a right-of-way from the U.S. Army.

Federal Aviation Administration	Makes obstruction evaluation of Notices of Proposed Construction or Alteration (FAA Form 7460-1) as required by DOT Advisory Circular 70/7460-2F.
Federal Communications Commission	Grants licenses to operate microwave and communication systems.
Fish and Wildlife Service	Kofa Route crosses the Kofa National Wildlife Refuge, which would require a right-of-way from FWS.
Nuclear Regulatory Commission	Processes licensing actions relating to PVNGS including transmission of power to a distribution center. (This ES is being prepared jointly by the Department of the Interior and NRC with Interior acting as lead agency.)

ARIZONA STATE AGENCIES

Arizona Power Plant and Transmission Line Siting Committee	Issues certificates of environmental compatibility for transmission lines.
Arizona State Land Department	Grants rights-of-way across State lands.
Department of Transportation	Grants encroachment permits for crossing State highways.

CALIFORNIA STATE AGENCIES

State Lands Commission	Grants rights-of-way across State lands.
California Department of Transportation (CALTRANS)	Grants encroachment permits for crossing State highways.
Public Utilities Commission	Approves environmental assessment and grants right to proceed with construction.

APPLICANT'S PROPOSED ACTION

PURPOSE

The purpose of the proposed powerline is to transmit Southern California Edison's entitlement of 585 MW from the PVNGS near Phoenix, Arizona, to the applicant's Devers Substation located near Palm Springs, California.

DESCRIPTION AND LOCATION OF COMPONENTS

Corridor Description

The applicant's route as identified in the January 20, 1977, application, one full-length alternative, other shorter subalternate routes, and telecommunication facilities are presented on the Study Area Map 1-1. The proposed and alternative route will be analyzed and evaluated subject to the same criteria. Each corridor considered in this document is 2-miles-wide (3.2 km). Subalternate routes and non-viable routes are discussed in chapter 8.

The proposed (Brenda) transmission route has an approximate length of 107 miles (172 km) in Arizona and 128 miles (206 km) in California. It would cross approximately 135 miles (217 km) of public lands administered by BLM. The remaining lands crossed are privately-owned except for 10 miles (16 km) of State land in Arizona and 2 miles (3.2 km) of Agua Caliente Tribal land near Thousand Palms, California, see map 1-1, and table 1-2. The one full-length alternative (Kofa) route is of similar length, 237 miles (381 km). It would cross 133 miles (214 km) of public lands, 99 miles (159 km) of private and 5 miles (8 km) of State land.

TABLE 1-2

SUMMARY OF LAND OWNERSHIP ALONG THE TWO STUDY ROUTES

	BRENDA ROUTE Miles - (Kilometers)		KOFA ROUTE Miles - (Kilometers)	
State:				
Arizona	10 mi	(16.1 km)	5 mi	(8.0 km)
California	0		0	
BLM	135 mi	(217.2 km)	95 mi	(152.9 km)
U.S. Army	0		13 mi	(20.9 km)
FWS	0		25 mi	(40.2 km)
Private	88 mi	(141.6 km)	99 mi	(159.3 km)
Indian Land	2 mi	(3.2 km)	0	
TOTAL	235 mi	(378.1 km)	237 mi	(381.3 km)

Source: BLM Team

Brenda Route (SCE Proposed Route)

The Brenda Route exits PVNGS to the west and then parallels the El Paso Natural Gas (EPG) pipeline northwest across the Harquahala Plains. The route then angles westerly, crossing the Plomosa Mountains just south of Interstate Highway 10 (I-10). It then turns southwest to cross the Dome Rock Mountains at Copperbottom Pass. It transects the Colorado River about 5 miles (8 km) south of Blythe, California. From the Colorado River the Brenda Route continues west crossing the Palo Verde Valley and then continues northwest around the Mule Mountains across the Chuckwalla Valley to Desert Center. From this point it runs south of and roughly parallel to I-10 to Thermal Canyon. At Thermal Canyon, the Brenda Route crosses I-10 and then parallels an existing transmission line for most of the remaining distance to the Devers Substation (see map 1-1).

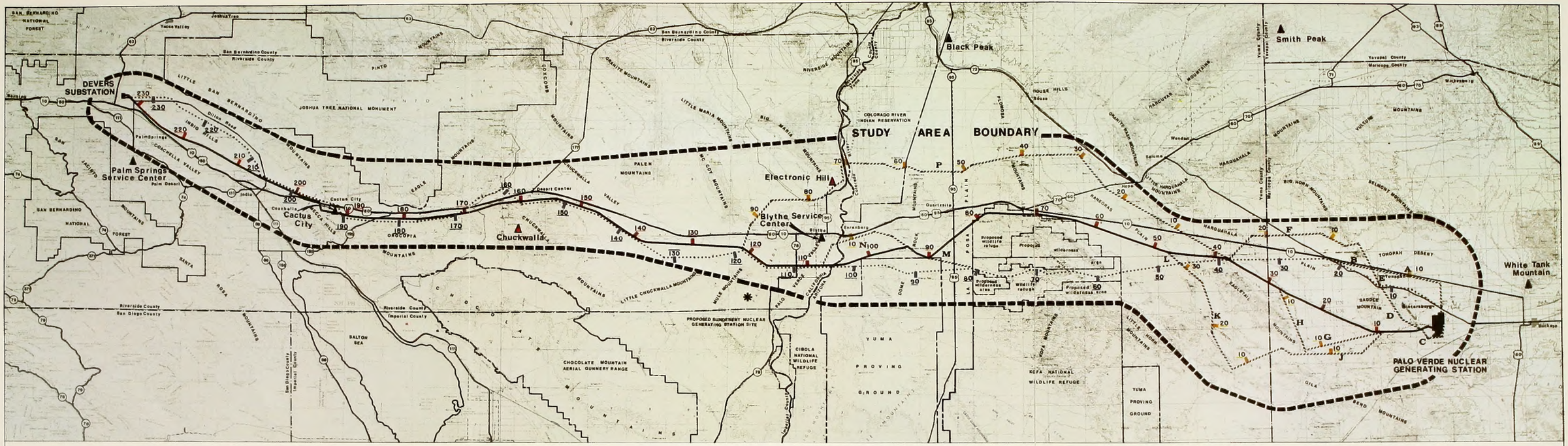
Kofa Route

The Kofa Route exits PVNGS north and parallels the Buckeye-Salome road to I-10. This route then proceeds west to connect with the EPG pipeline and parallels the pipeline through the Kofa National Wildlife Refuge. From the Wildlife Refuge, the route continues west across the Yuma Proving Ground and rejoins the Brenda Route at the Colorado River crossing. With minor variations, the Brenda and Kofa Routes coincide until they reach Desert Center. At this point, the Kofa Route crosses I-10, continues westerly for 12 miles (19.3 km) and then recrosses I-10 east of the Joshua Tree National Monument. The route crosses I-10 a third time about 3 miles (4.8 km) east of Cactus City. Both routes coincide into Indio, where the Kofa Route turns north circumventing the Indio Hills, paralleling an existing powerline into the Devers Substation (see map 1-1).

Transmission Line Description

Towers

Two types of transmission line structures (towers) have been proposed to support the transmission line conductors. One is free-standing, the other type is guyed. Both are to be constructed of aluminum or galvanized steel. The typical tower-to-tower spacing is 1,500-feet (457 m) for guyed towers and 1,600-feet (487 m) for free-standing towers with spans anticipated from 1,200 feet (366 m) to 2,200 feet (671 m). The Brenda Route requires approximately 813 towers, and the Kofa Route 823 towers. The applicant has indicated that free-standing towers may be used for the entire length of the transmission line.



N

NEVADA
CALIFORNIA
ARIZONA
STUDY AREA

0 5 10 20 MILES
0 10 20 KILOMETERS

ROUTES UNDER STUDY
BRENDA
KOFA
SUBALTERNATES
A

LEGEND

MILEPOSTS
- BRENDA
- KOFA
- SUBALTERNATES

TELECOMMUNICATION SITES
- EXISTING
- PROPOSED

- STUDY AREA BOUNDARY
- STATE HIGHWAY
- INTERSTATE HIGHWAY
- FEDERAL HIGHWAY
- COUNTY LINES
- STATE LINE

SOURCE: BLM TEAM & APPLICANT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

STUDY AREA

Typical conductor height aboveground is 60 feet (18.3 m). Minimum aboveground height is 35 feet (10.7 m) as required by the National Electric Safety Code and California Public Utilities Commission General Order 95. The exact height of each tower will be governed by topography and the safety requirements for conductor clearance. Refer to figures 1-1 and 1-2 for tower and foundation design details.

Freestanding Towers: Freestanding square-based towers are proposed for use in rugged terrain and agricultural areas and over major highway and river crossings. Typical tower height is expected to be 140 feet (42.7 m). A 200-foot (61 m) right-of-way is requested for freestanding towers.

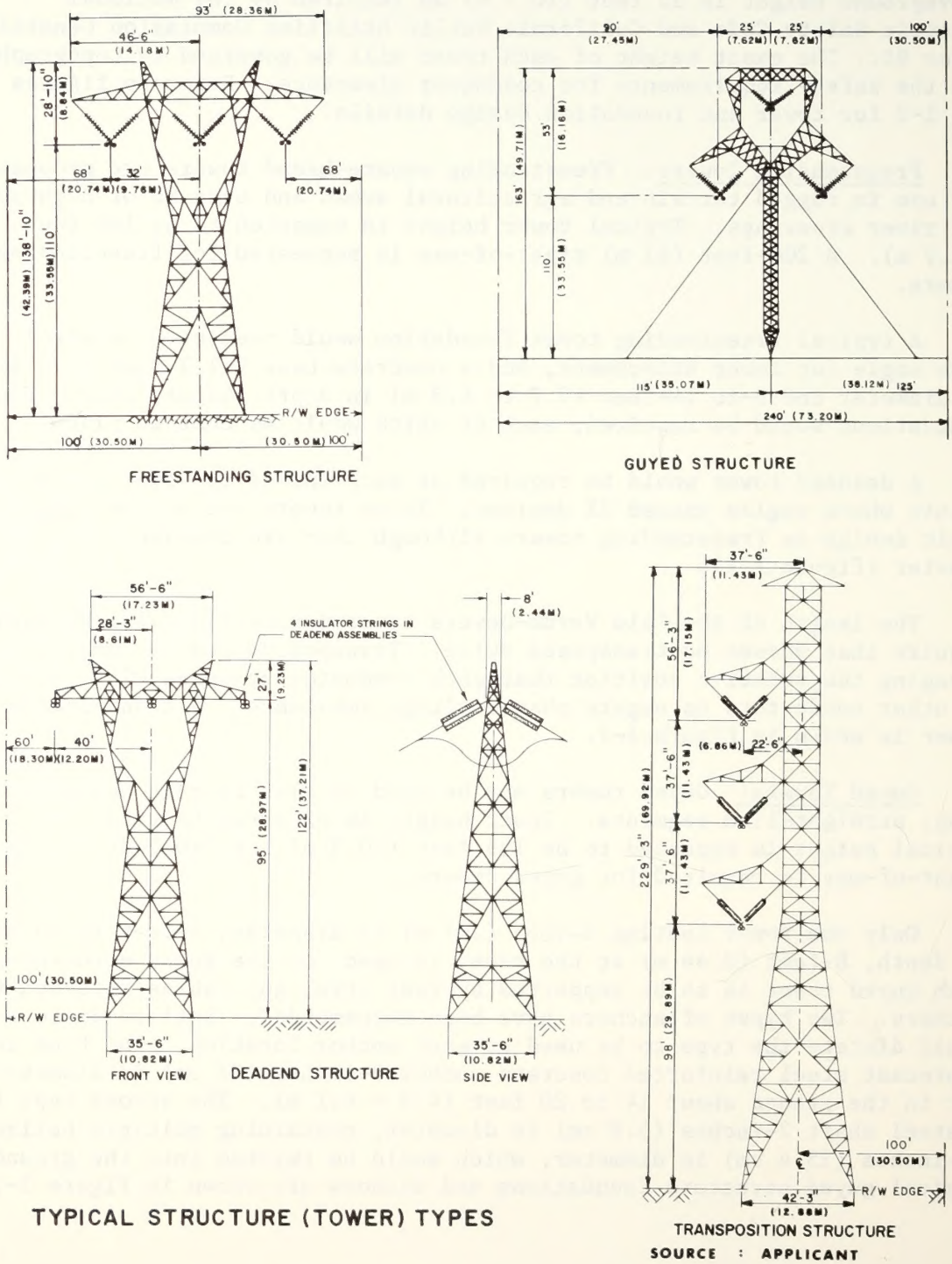
A typical freestanding tower foundation would consist of a steel stub angle for tower attachment, and a concrete base 2-1/2-feet (.76 m) in diameter and 9-to 14-feet (2.7 to 4.3 m) in depth (figure 1-2). Four foundations would be required, each of which would be cast in place.

A deadend tower would be required at each end of the line and at points where angles exceed 22 degrees. These towers are of the same basic design as freestanding towers although they are considerably heavier (figure 1-1).

The length of the Palo Verde-Devers transmission line will probably require that phases be transposed twice. Transposing phases consists of changing the relative position that each conductor occupies with respect to other conductors to negate phase-voltage imbalance. A transposition tower is shown in figure 1-1.

Guyed Towers: Guyed towers may be used on flat terrain and over long, straight-line segments. Tower height is expected to vary. Typical height is expected to be 165 feet (50.3 m). A 240-foot (73 m) right-of-way is required for guyed towers.

Only one tower footing 2-feet (.61 m) in diameter, 7-feet (2.13 m) in depth, 8-feet (2.44 m) at the base, is used for the guyed structures. Each guyed tower is to be supported by four steel guy cables attached to anchors. Two types of anchors have been recommended. Soil conditions would dictate the type to be used at each anchor location. One type is a precast steel reinforced concrete anchor 9-inches (23 cm) in diameter, set in the ground about 14 to 20 feet (4.3 - 6.1 m). The second type is a steel shaft 2-inches (5.8 cm) in diameter, containing multiple helixes 10-inches (25.4 cm) in diameter, which would be twisted into the ground. Typical guyed structure foundations and anchors are shown in figure 1-2.



TYPICAL STRUCTURE (TOWER) TYPES

SOURCE : APPLICANT

Figure 1-1.

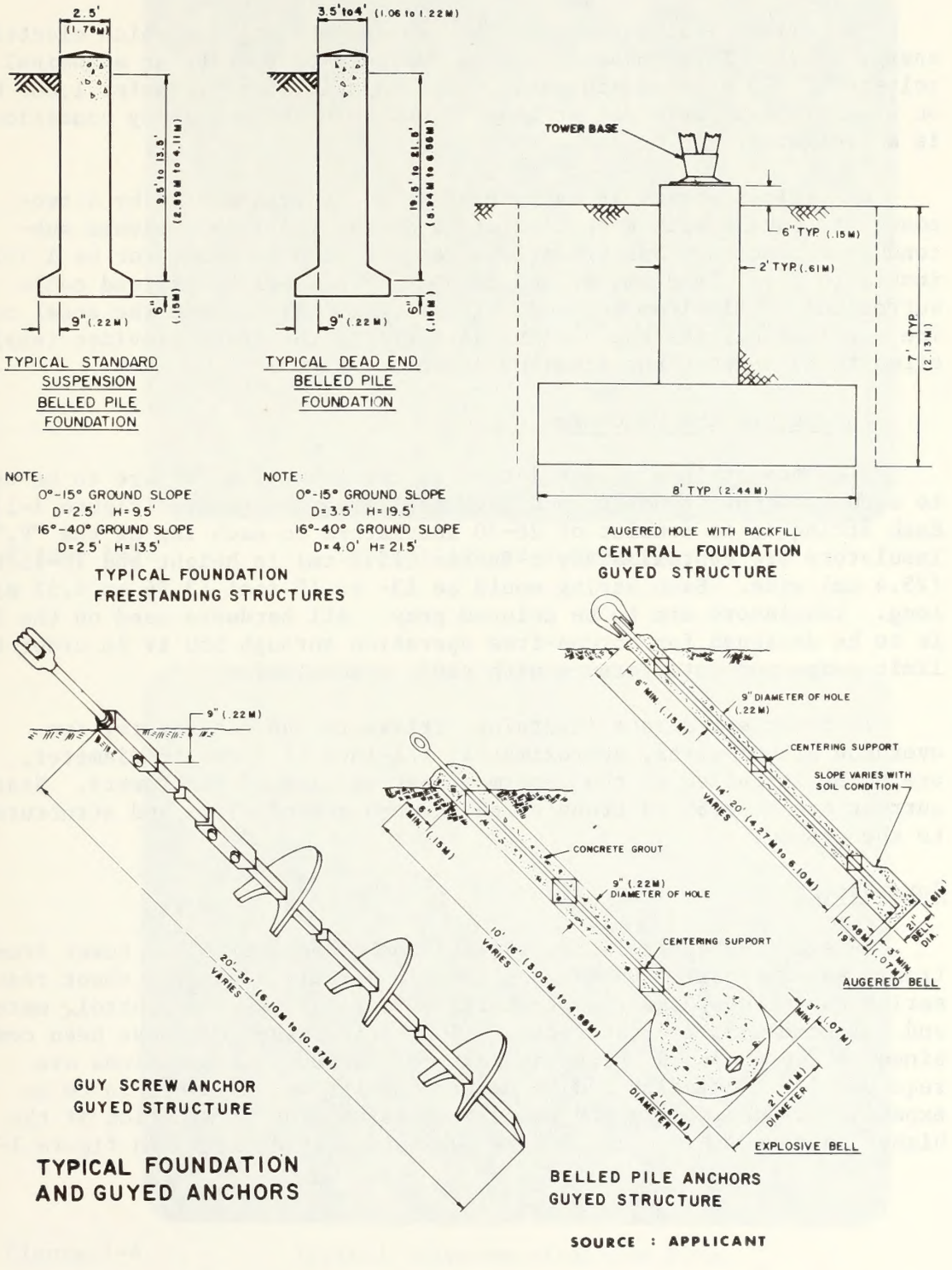

2.5'
(1.78M)
9.5' to 13.5'
(2.89M to 4.11M)
6"
(.15M)
9" (.22M)
TYPICAL STANDARD
SUSPENSION
BELLED PILE
FOUNDATION
NOTE:
0°-15° GROUND SLOPE
D=2.5' H=9.5'
16°-40° GROUND SLOPE
D=2.5' H=13.5'
3.5' to 4' (1.06 to 1.22M)
19.5' to 21.5'
(5.94M to 6.55M)
6"
(.15M)
9" (.22M)
TYPICAL DEAD END
BELLED PILE
FOUNDATION
NOTE:
0°-15° GROUND SLOPE
D=3.5' H=19.5'
16°-40° GROUND SLOPE
D=4.0' H=21.5'
TYPICAL FOUNDATION
FREESTANDING STRUCTURES
TOWER BASE
6" TYP (.15M)
2' TYP (.61M)
7' TYP
(2.13M)
8' TYP (2.44M)
AUGERED HOLE WITH BACKFILL
CENTRAL FOUNDATION
GUYED STRUCTURE
9" (.22M)
20'-35' (6.10M to 10.67M)
VARIES
GUY SCREW ANCHOR
GUYED STRUCTURE
TYPICAL FOUNDATION
AND GUYED ANCHORS
6" MIN (.15M)
9" DIAMETER OF HOLE
(.22M)
CENTERING SUPPORT
SLOPE VARIES WITH
SOIL CONDITION
14' 20' (4.27M to 6.10M)
VARIES
6" MIN (.15M)
CONCRETE GROUT
9" (.22M)
DIAMETER OF HOLE
CENTERING SUPPORT
10' 16' (3.05M to 4.88M)
VARIES
AUGERED BELL
3" MIN (.07M)
2' (.61M)
DIAMETER
EXPLOSIVE BELL
BELLED PILE ANCHORS
GUYED STRUCTURE
SOURCE : APPLICANT

Figure 1-2.

Conductors

Electrical conductors provide the medium over which electrical energy flows. The proposed line is designed to operate at a nominal voltage of 525 kV phase-to-phase. The capability to transfer 1,000 MW on a continuous basis and at least 2,000 MW under emergency conditions is anticipated.

Electrical energy in each phase is to be transmitted by a two-conductor bundle with a spacing of 18 inches (45.7 cm) between subconductor centers. Specifications require each subconductor be 1.762-inches (4.5 cm) in diameter and consist of a steel reinforced cable surrounded by aluminum strands which form a helix around the steel core. The aluminum carries the electrical current; the steel provides tensile strength to support the aluminum strands.

Insulators and Hardware

Two strings of insulators in the form of a "V" are to be used to suspend each conductor bundle (phase) from the towers (figure 1-1). Each string is to consist of 26-30 insulators on each leg of the "V." Insulators are approximately 6-inches (15.2 cm) in height and 10-inches (25.4 cm) wide. Each string would be 13- to 15-feet (3.96 to 4.57 m) long. Insulators are to be colored gray. All hardware used on the line is to be designed for corona-free operation through 550 kV in order to limit noise and interference with radio transmission.

To intercept direct lightning strikes to the conductors, two overhead ground wires, approximately 1/2-inch (1.3 cm) in diameter, are to be installed at the uppermost extremities of the towers. Static current can thereby be transferred through ground wires and structures to the ground.

Substations

Substations control the distribution of bulk electric power from transmission lines. Substations contain circuit breakers, shunt reactors, series capacitors, and transformers, as well as related control, metering, and telecommunication facilities. Substation functions have been combined in the proposed system so that no new 500 kV substations are required. The existing 220 kV Devers Substation, however, is to be expanded to accommodate the new transmission line termination at the higher voltage. A typical 500 kV substation is depicted in figure 1-3.

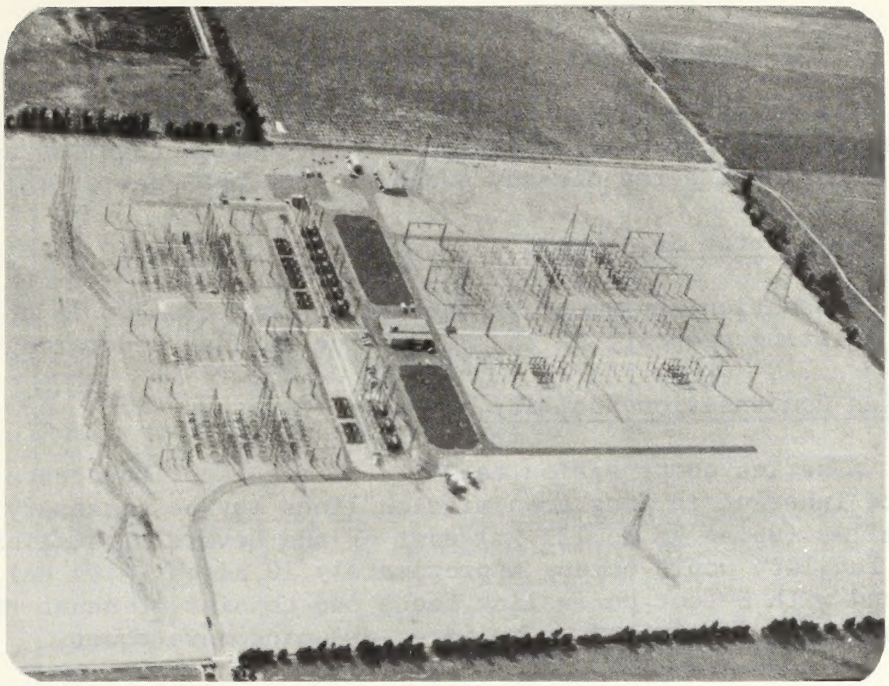


Figure 1-3. Typical 500 kV Substation

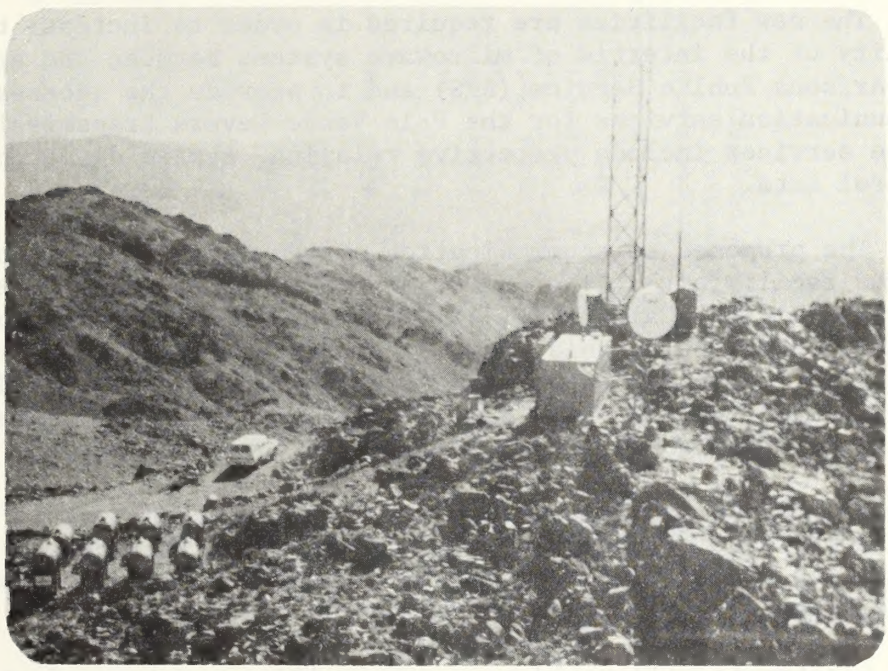


Figure 1-4. Typical Telecommunications Site

Devers Substation

The existing Devers Substation is approximately 60-acres (24.3 ha) in size. The proposed expansion of the station requires approximately 180 additional acres already owned by the applicant at the substation site.

Palo Verde Switchyard

Substation equipment at the Palo Verde terminus is to be located on the existing property of the Palo Verde Nuclear Generating Station.

Series Compensation Facility

A series compensation facility to regulate inductance and capacitance inherent in long transmission lines may be necessary about 60 to 80 miles (96.54 km to 129 km) east of the Devers Substation. If so, the facility would occupy approximately 10 acres (4.05 ha). It would be fenced with 8-foot chain link fence and consist of shunt reactors, series capacitors, a maintenance building and microwave tower.

Communication Network

The proposed telecommunications system will be composed of both existing and new facilities (map 1-1 and table 1-3).

The new facilities are required in order to increase the reliability of the intertie of microwave systems between the applicant and Arizona Public Service (APS) and to provide the necessary telecommunication services for the Palo Verde-Devers transmission line. These services include protective relaying, system dispatching, and load control data.

The proposed telecommunication system would involve construction of new facilities: (1) on Electronic Hill (also known as Big Maria) north of Blythe, California, (2) in the Chuckwalla Mountains, south of Desert Center, California, and (3) at Blythe. Facility descriptions for all sites, including anticipated improvements and disturbed areas, are presented in table 1-3. Figure 1-4 depicts a typical communication site. Helipads would not be necessary at proposed sites.

The Chuckwalla site construction is projected next to existing facilities and includes a prefab building, an 110-foot (33.55 m) tubular or lattice steel tower, an emergency generator, and fuel tanks. Commercial power is available and an access road exists.

Electronic Hill would be a new facility constructed at an existing developed telecommunication site. This site will include a concrete block building, an 85-foot (25.92 m) tubular or lattice steel tower, an

TABLE 1-3

TELECOMMUNICATION SYSTEM

LOCATION	SITE DESCRIPTION	IMPROVEMENTS						APPROXIMATE ACREAGE		
		BLDG.	TOWER	HELIPAD	POWER	FENCE	EMERG. GEN.	TEMP. DISTURBED	PERM. DISTURBED	TOTAL SITE
Devers	Existing SCE Sub.	Exist	Exist	None	Exist	Exist	Exist	0	0	Exist
Palm Springs	Existing SCE District Office	Exist	Exist	None	Exist	Exist	New	0	0	Exist
Cactus City	Existing SCE & CA State Micro. Sta.	Exist	Exist **	None	Exist	None	Exist	0	0	Exist
Chuckwalla	New Facility adjacent to others	New	New	None	New	None	New	1/4 Acre (.10 ha)	1/8 Acre (.05 ha)	1/4 Acre (.10 ha)
Blythe	Existing SCE District Office	Exist	New	None	Exist	Exist	New	0	0	Exist
Electronic Hill	New facility adjacent to others	New	New	None	New	New	New	1/4 Acre (.10 ha)	1/8 Acre (.05 ha)	1/4 Acre (.10 ha)
Black Peak	Existing APS Micro. Sta.	Exist	Exist ***	None	Exist	None	New	1/8 Acre (.05 ha)	0	Exist
Smith Peak	Existing APS Micro. Sta.	Exist	Exist ***	None	Exist	None	New	1/8 Acre (.05 ha)	0	Exist
White Tank	Existing APS Micro. Sta.	Exist	Exist ***	None	Exist	Exist	New	1/8 Acre (.05 ha)	0	Exist
*Palo Verde	New Gen. Sta. (See APS EIR)	Exist APS	Exist APS	None	Exist APS	Exist APS	Exist APS	0	0	Exist APS

* Only additional electric equipment would be installed at these locations.
** Tower addition might be necessary.
*** Tower replacement might be necessary.

Source: Applicant

emergency generator, fuel tanks, and a fence. A road already leads to the site, and commercial power is available.

The proposed Blythe facility is to be built inside the existing fenced Southern California Edison Service Center. Major additions are to include a 110-foot (33.55 m) tubular or lattice steel tower, an emergency generator, and fuel tanks.

All other facilities are existing unmanned telecommunication sites. Emergency generators and replacement of existing towers may be required.

Temporary Use Areas

Construction Yards and Batch Plants

Construction is scheduled to take place in Arizona and California simultaneously, beginning with the establishment of a temporary construction yard near each end of the line. Additional yards of approximately 5 acres (2 ha) are to be located every 25 to 30 miles (40-48 km) along the route. The yards will serve as reporting locations for workers and for vehicle and equipment parking. They will also serve as sites for material storage and equipment maintenance stations. These facilities will be fenced and gates locked. Security guards will be stationed where appropriate. See table 1-4 for a summary of temporarily and permanently occupied land areas.

A portable concrete batch plant, occupying approximately 1 acre (.40 ha) is to be located every 15 to 20 miles (24-32 km) for use in constructing foundations. A rubber-tired flatbed truck and tractor will be used to relocate each plant (in two sections) along the right-of-way. Relocation is expected to be necessary every 4 to 6 weeks.

Equipment Pads

Leveled areas (pads) will be needed at each tower site to facilitate safe equipment operation. These pads will provide space for tower assembly and cranes for erection as well as for preparation of footing and anchor sites. Equipment pads are to be approximately 30 by 40 feet (9.15 by 12.2 m). Gravel may be necessary on some soil types. Where the location is determined by the authorizing agency to be environmentally sensitive, helicopters or alternative construction methods, not requiring roads or crane pads, will be implemented.

Tension and Pulling Stations

Conductor stringing is to be initiated by rope lines flown in by helicopter. The conductor will then be drawn from tower to tower by pulling stations (figure 1-5). Each station is to occupy approximately 200 by 300 feet (61 by 92 m) along the right-of-way. They are to be located approximately every 3 miles (4.8 km).

TABLE 1-4

SUMMARY OF LAND AREAS TEMPORARILY AND PERMANENTLY OCCUPIED

	Units		(Acres/Hectares) Temporarily Occupied		(Acres/Hectares) Permanently Occupied	
	Brenda	Kofa	Brenda	Kofa	Brenda	Kofa
TOWERS						
* Guyed towers	[a] 560 ea	[a] 500 ea	[c] 515/209	[c] 460/186	[d] 218/88	[d] 195/79
Freestanding towers	[b] 253 ea	[b] 323 ea	[c] 233/94	[c] 297/120	[e] 8/3	[e] 10/4
ROADS						
New main roads	141 mi 227 km	93 mi 150 km	[f] 341/138	[f] 225/91	[g] 240/97	[g] 158/64
New spur roads	55 mi 88 km	55 mi 88 km	133/45	133/54	93/38	93/38
WORK AREAS						
Tension and pulling stations	[h] 78 ea	79 ea	108/44	109/44	0	0
Construction yards	[i] 9 ea	9 ea	45/18	45/18	0	0
Batch plants	[j] 16 ea	16 ea	16/6.5	16/6.5	0	0
Communication sites	10 ea	10 ea	1/.40	1/.40	.25/.10	.25/.10
Series Compensation Facility	1 ea	1 ea	10/4	10/4	10/4	10/4
TOTALS			1402/568	1296/524	569/230	466/189

a 3.6 guyed towers per mile.
b 3.3 freestanding towers per mile.
c 200' x 200' = 0.92 acres (.37 ha) temporarily occupied at each tower.
d 130' x 130' = 0.39 acres (.16 ha) permanently occupied under each guyed tower.
e 36' x 36' = -.03 acres (.01 ha) permanently occupied under each freestanding tower.
f 14' + 6' wide = 2.42 acres (.98 ha) per mile road bed and road shoulder.
g 14' wide = 1.70 acres (.69 ha) per mile permanently occupied road bed.
h 200' x 300' = 1.38 acres (.56 ha) every 3 miles per tension and pulling stations.
i 5 acres (2.02 ha) each 25 miles (40 km) for construction yard.
j 1 acre each 15 miles (24 km) for batch plants.

* If freestanding towers are used exclusively, acreages permanently occupied will be significantly reduced. See d and e above.

Source: BLM Team

BASIC EQUIPMENT CONNECTED WITH WIRE HANDLING

SOURCE : APPLICANT

Figure 1-5.

Access Roads

Unpaved access roads will be necessary for the construction, operation, and maintenance of the transmission line. These roads will consist of a main road running the length of the right-of-way and spur roads connecting the main road with tower sites.

Existing roads will be used where the right-of-way closely parallels a utility corridor or where other existing roads provide easy access to the line. Where existing roads can be used, only spur roads to the sites will be required.

Main and spur access roads will be constructed on the right-of-way where existing roads are lacking unless conditions dictate otherwise.

All roads are to be constructed with proper drainage in accordance with the applicant's standard specifications for transmission line access roads. In the event of a conflict between the applicant's specifications and requirements of the Bureau of Land Management, the States of Arizona and California, or other agencies, the requirements of the governing agency will take precedence, see typical cross sections in figure 1-6.

Main and spur road mileages are conceptual estimates based on certain assumptions about access roads. The following assumptions were made:

(1) No main road will be required where the line parallels existing facilities such as transmission lines or pipelines.

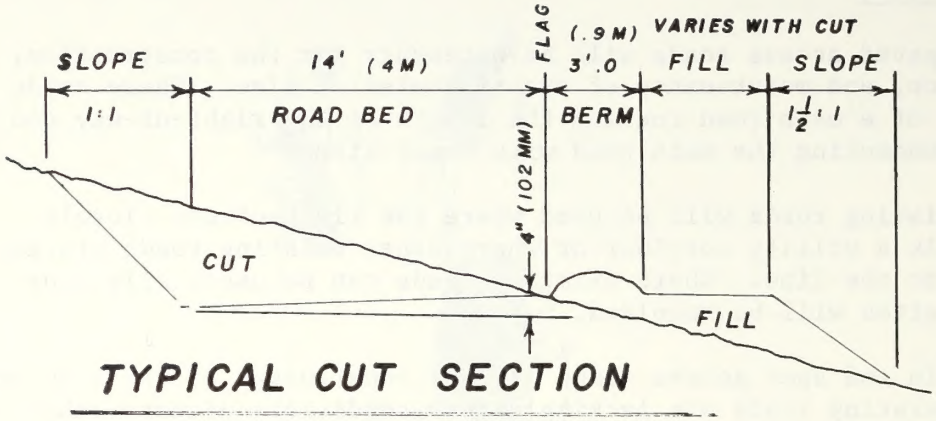
(2) No permanent main road will be necessary in agricultural areas.

(3) Spur roads are estimated at 0.2 mile (.32 km) per mile of line in flat terrain and 0.5 mile (.80 km) per mile of line in mountainous terrain.

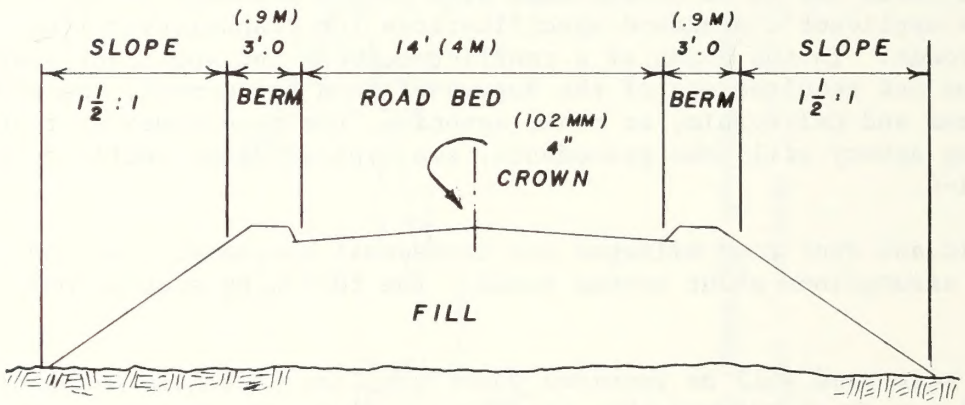
Based on the above assumptions, the Brenda Route will require the construction of 196 miles (315 km) of new access roads. Of this total, 141 miles (227 km) are to be new main roads and 55 miles (88 km) spur roads. The Kofa Route requires 148 miles (238 km) of new access roads. Of this total 93 miles (150 km) are to be main roads and 55 miles (88 km) spur roads.

Land Requirements

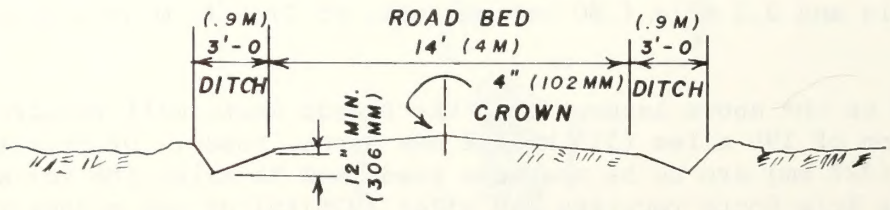
Table 1-4 presents a summary of general land requirements and surface disturbance associated with constructing the powerline and ancillary facilities.



TYPICAL CUT SECTION



TYPICAL FILL SECTION



TYPICAL FLAT SECTION

ACCESS ROAD DETAIL

Figure 1-6 SOURCE : APPLICANT

CONSTRUCTION SCHEDULE AND IMPLEMENTATION STAGES

The present schedule lists May, 1982, for initial commercial operation of the PVNGS Unit 1, with Unit 2 and Unit 3 following at 2-year intervals, respectively. Turbine roll date of Unit 1 is January 1, 1982, and intermittent power will be available at that time. To ensure that the proposed transmission system is available to transmit power, SCE proposes to start construction in July, 1980, and finish by December 1, 1981.

Preliminary Right-of-Way Studies

After completion of the company's environmental study to select a practical corridor, preliminary field surveys were conducted to: (1) locate primary engineering control points and section corners, and (2) conduct an archaeological reconnaissance along the proposed alignment. Should an alternative corridor prove more desirable, SCE will study the alternative corridor for a preferred alignment, conduct field searches for primary engineering control points, and survey to tie the preliminary transmission line angle points to established land surveys.

Right-of-Way Layout and Surveys

If a right-of-way is granted, the applicant will refine the preliminary study and conduct a detailed archaeological survey of the route. The applicant plans to employ small survey crews to locate tower sites along the approved route. There may also be additional site visits for archaeological salvage purposes or tower site relocation to reduce conflicts with other resource values. Following the final survey, engineering design for the sites will be completed to allow planning for tower height, type of tower footing, and other requirements.

Right-of-Way Acquisition

Land required for the proposed transmission line right-of-way on private lands in California is to be purchased in fee title when possible. Acquisition of the right-of-way in Arizona will be by easement. The respective landowners are to be paid just compensation based upon either an appraisal or by a negotiated settlement satisfactory to both parties. Condemnation of private property might be necessary in instances where agreement cannot be reached (see table 1-2 for a summary of land ownerships along the two study routes). Right-of-way on public lands administered by BLM will be acquired in accordance with the Federal Land Policy and Management Act of 1976.

Construction Sequence and Techniques

Substation Construction

Construction work at PVNGS and Devers Substation will consist of grading, installing foundations, erecting steel, and installing and connecting equipment and fencing. All substation work required for the Palo Verde-Devers transmission line is to take place within a 16-1/2-month period.

A maximum of 75 men will be required to modify the existing switchyard at Devers. Grading and compaction equipment, concrete trucks, material hauling vehicles, and cranes will be required.

Telecommunications System

Approximately eight men will be needed during peak construction periods at any site requiring a new building or tower. Subsequent to construction, facilities will normally be unmanned.

Construction of each relay station would consist of the following steps:

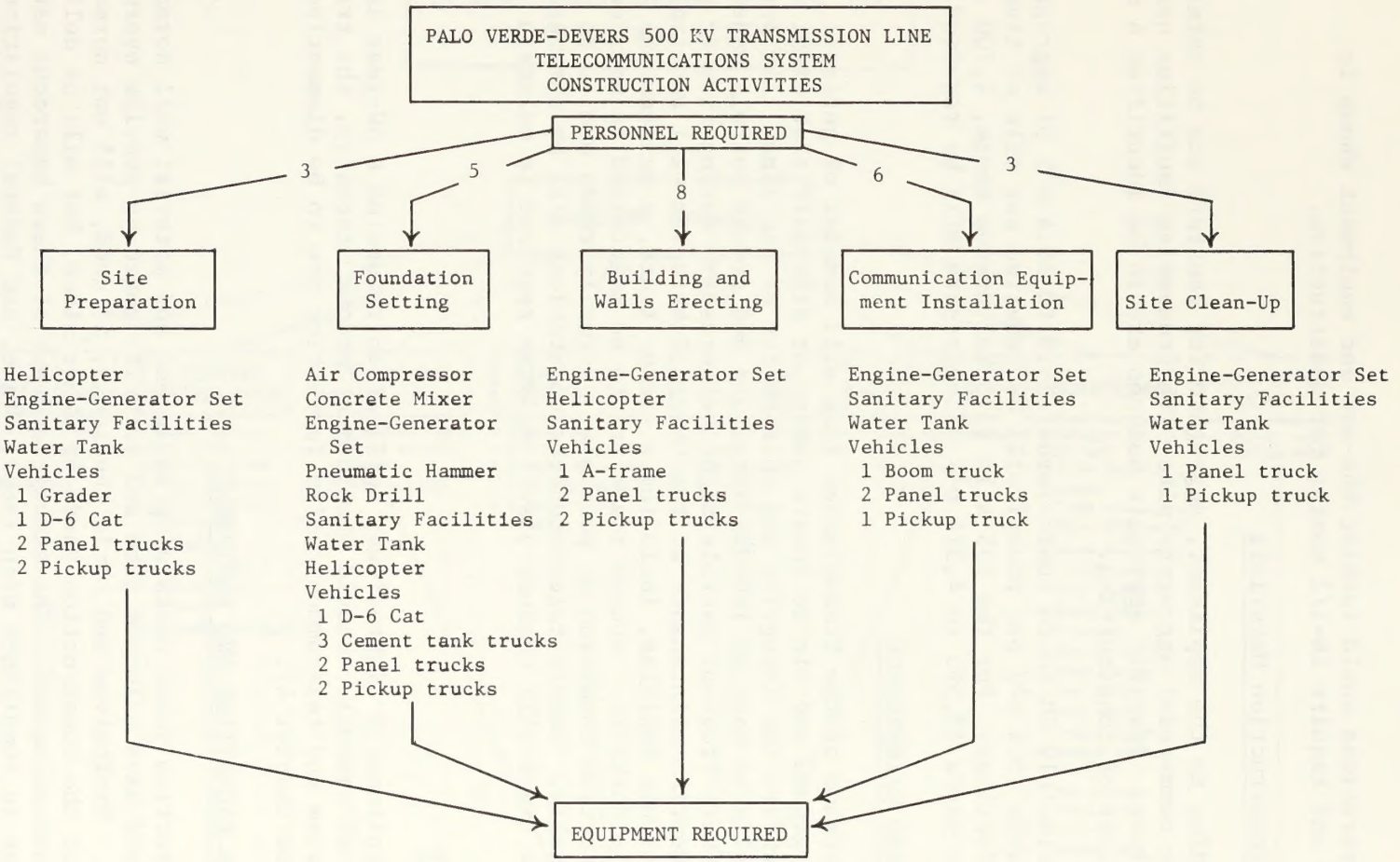
(1) Site preparation
(2) Setting the foundations
(3) Erecting the building, tower, fuel tanks, and fencing
(4) Telecommunications equipment installation
(5) Site cleanup.

The operations would involve the use of men and equipment as indicated in figure 1-7.

Transmission Line Construction

Construction of the transmission line would consist of the following steps:

(1) Road construction
(2) Footing installation
(3) Structure steel haul
(4) Structure assembly
(5) Structure erection
(6) Guard pole installation
(7) Conductor stringing
(8) Cleanup.



Source: Applicant

Figure 1-7.

The operations would involve the men and equipment shown in figure 1-8 and require 16-1/2 months for construction.

Source of Construction Materials

According to the applicant, aggregate for concrete can be obtained from active commercial aggregate pits with processing facilities near work locations. Specific aggregate sources are to be identified 6 months prior to start of construction.

Approximately 20 to 24 cubic yards (15.3 to 18.4 m^3) of aggregate (7 cubic yards (5.4 m^3) per tower) will be required per mile of line for tower footings. For the 235 mile (378 km) Brenda Route, 4,700 to 5,640 cubic yards (3,595 to 4,314 m^3) of aggregate will be required.

OPERATION AND MAINTENANCE

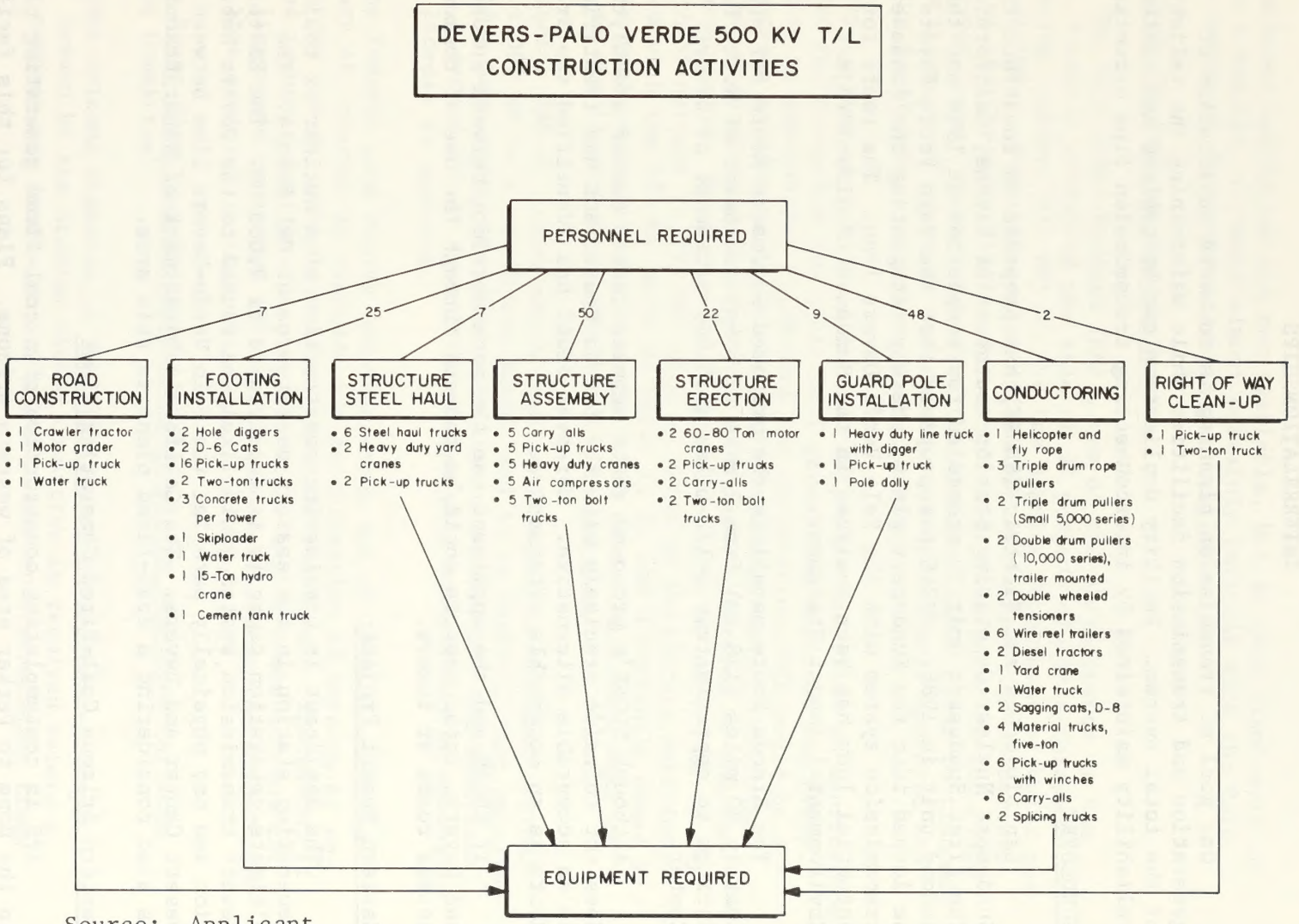
Maintenance of the transmission line will consist of periodic patrols by ground and air to locate damage or disrepair that might adversely affect the integrity and reliability of the line. Air patrols would normally be made at 180-day intervals and ground patrols made annually. More frequent patrols might be necessary during fire or storm seasons. Routine maintenance at the Devers Substation will require three additional vehicles, including a pickup truck, a maintenance truck, and a forklift. Access roads are to be maintained as near original construction condition as possible. Normally roads are to be graded annually. Remote telecommunication stations will be unmanned. Maintenance crews will conduct visits only as required to maintain service.

ABANDONMENT

The applicant's right-of-way application requested a 50-year lease with right of renewal. Should abandonment become necessary, the transmission system and telecommunication facilities are to be dismantled and removed (see chapter 4).

SECURITY OF FACILITIES AND EQUIPMENT

Construction yards containing equipment and material will normally be fenced and have a locked gate and security guard to provide overnight protection. Explosives and toxic chemicals, if used, will not normally be stored at the construction yards or other sites, but will be delivered by the vendor as needed. The storage and use of these hazardous materials will be done in compliance with local, State, and Federal regulations. After construction is complete, no security measures will be provided other than periodic inspection patrols by operating personnel.



Source: Applicant

Figure 1-8.

INTERRELATIONSHIPS

One goal of transmission planning is to avoid duplication of generation and transmission facilities while maintaining the reliability of the total system. Facility duplication can be avoided and system reliability maintained by interconnecting transmission line networks.

SUNDESERT

San Diego Gas and Electric (SDG&E) has proposed to construct the Sundesert Nuclear Generating Station southwest of Blythe, California. The first Sundesert unit is scheduled for completion in 1984 and the second unit in 1986. SDG&E has proposed that the Palo Verde-Devers line be looped into the Sundesert plant, thereby integrating the Sundesert transmission system with the Palo Verde-Devers line. The route for this potential loop has been analyzed in the Sundesert Nuclear Project Environmental Impact Statement.

The Brenda Route parallels the proposed Sundesert Route for approximately 80 miles (128 km) from 1-mile (1.6 km) southeast of North Palm Springs to approximately 3-1/2-miles (5.6 km) southeast of Desert Center.

Although SDG&E's proposed route between Desert Center and Blythe does not coincide precisely with the Brenda Route, SCE has identified it as an acceptable alternative. Moreover SDG&E has identified the Brenda Route as an acceptable alternative.

If SDG&E and the applicant use the same corridor between Sundesert and Devers, total impacts could be reduced through the use of common access roads or towers.

Eastern Desert Project

The applicant is considering construction of a nuclear or coal generating station in the eastern desert area of California. The ultimate generation capacity is expected to be 2,000 MW. The Eastern Desert transmission system would likely be routed to the Devers Substation and may physically parallel the Palo Verde-Devers line between Desert Center and Devers. The California Department of Water Resources is also considering a coal-fired plant in this area.

Western Arizona Coal-Fired Generating Plant

APS is contemplating construction of a coal-fired generating plant in the Hope to Parker area of western Arizona. Plans for this facility are not firm at this time, and specifics regarding schedules or possible

transmission facilities are not available, but if this plant were to become a reality, it would almost certainly intertie with the Palo Verde-Devers or Sundesert transmission systems.

Palo Verde Nuclear Generating Station

The Salt River Project (SRP), one of the participants in the PVNGS, recently announced the sale of 30 percent of SRP's Coronado Generating Station (210 MW) to the Los Angeles Department of Water and Power (LADWP). Under the agreement, LADWP will trade its 30 percent share of the Coronado Station for a 5.7 percent interest in the PVNGS when PVNGS begins operation. When this happens LADWP plans to transmit its entitlement of power to Los Angeles over previously approved and existing facilities, connecting with the PVNGS.

APS, acting on behalf of the participants, has filed an application with NRC for licensing two additional generating units at the PVNGS. According to information filed with the application, SCE would be a 32.3 percent participant, and the total participation by California entities would involve 55 percent of the power generated by the two additional units. Each unit would generate 1,235 MW (2,470 MW total) of which 55 percent (1,359 MW) will be owned by California entities. Combined with the 585 MW share of Units 1, 2, and 3 currently owned by SCE, eventual capability to transmit 1,943 MW to California will be needed if the license for Units 4 and 5 is granted.

Since a 500 kV transmission line is designed to transmit approximately 1,000 MW on a continuous basis, and it is doubtful that existing facilities have adequate excess capacity to accommodate the additional 943 MW, a second 500 kV transmission line will undoubtedly be necessary if the license is approved.

The Federal Land Policy and Management Act of 1976 directs the Secretary of Interior to minimize the proliferation of impacts by requiring the use of common corridors wherever practical. Therefore, if a second transmission line is proposed it is highly probable that the second line would be routed within the same corridor as the Palo Verde-Devers line analyzed in this statement (see chapter 6).

Arizona Power Plant and Transmission Line Siting Committee (Arizona Siting Committee)

Under Arizona statutes, a "Certificate of Environmental Compatibility" issued by the Arizona Siting Committee is required before a utility company may construct new power plants or transmission lines

exceeding 115 kV. On March 3, 1978, the Arizona Siting Committee voted to approve a "Certificate of Environmental Compatibility" for the route shown on map 1-2.

This ES identifies the impacts of constructing a 500 kV transmission line on any of the routes under consideration. In the decision-making process following the Final Palo Verde-Devers ES, the action taken by the Committee will be considered and weighed against the impacts identified in this Statement. If the decision is to allow the transmission line on a route other than the one approved by the Arizona Siting Committee, the applicant will be required to return to the Siting Committee and request modification of the Certificate.

MITIGATION COMMITMENTS BY SOUTHERN CALIFORNIA EDISON COMPANY

The environmental report submitted as part of the right-of-way application commits the applicant to the following measures edited from the environmental report. (Devers-Palo Verde 500 kV Transmission Line Environmental Report, 1977)

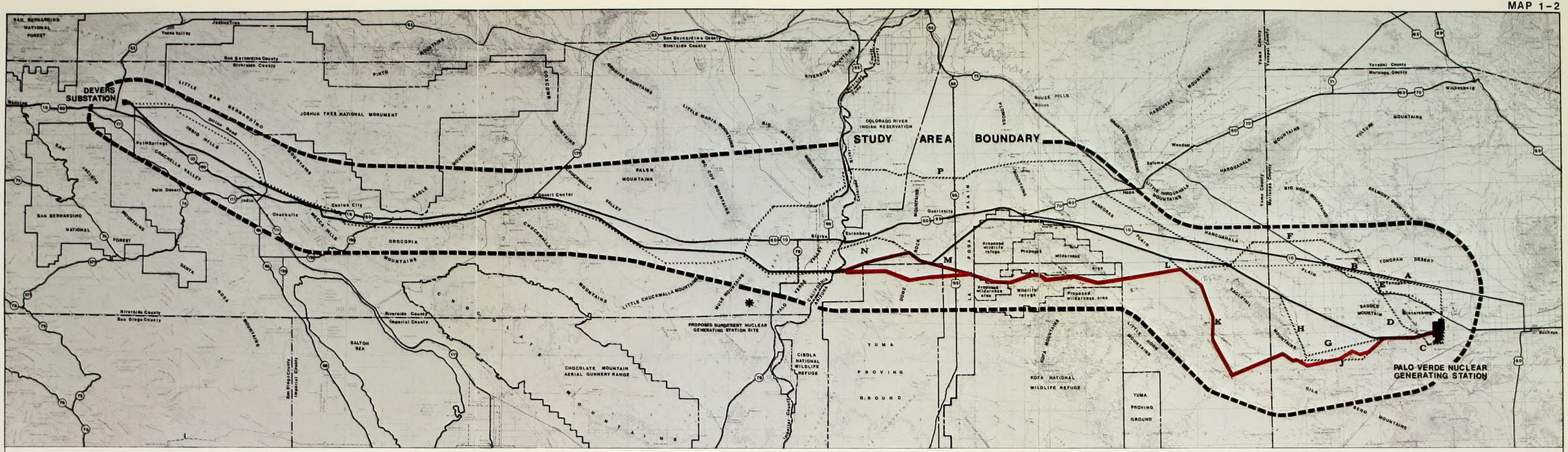
LEGAL AND INSTITUTIONAL MITIGATION MEASURES

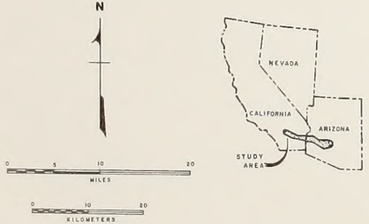
The applicant will comply with applicable State and Federal regulations in the selection and acquisition of the right-of-way, and in the design, construction, operation, and maintenance of the proposed transmission line. In addition, the applicant will follow responsible practices of the electric utility industry.

GENERAL GUIDELINES FOR CONSTRUCTION

Applicable guidelines become a part of all right-of-way selections as well as contracts dealing with construction of the proposed transmission line. A conservation construction plan relevant to preservation of the environment will be implemented with special considerations given to construction methods that will attempt to minimize the adverse impacts the proposed transmission facilities may have on the environment.

Contact has been and will continue to be made with local residents and property owners directly affected to inform them of the planned project and what may be expected during each construction phase. Operation schedules and types of construction equipment to be used in the area will be made public information. Potential problems identified by the applicant will be documented as part of the conservation plan and solutions implemented prior to construction whenever possible.





ROUTES UNDER STUDY

BRENDA

KOFA

SUBALTERNATES A

LEGEND

ROUTE APPROVED BY ARIZONA STATE POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

ROUTE APPROVED BY ARIZONA SITING COMMITTEE

Minimization of environmental impacts, during and resulting from construction, requires strict adherence to certain construction practices and strict avoidance of others. The applicant is committed to a policy that: (a) recognizes the importance of preserving the environment, (b) includes environmental planning as a part of all major system expansions, and (c) adheres to environmental guidelines developed by members of the Western States Coordinating Council (WSCC) (copy on file at BLM's Yuma District Office) that "...are designed to enhance and maintain a high quality environment while continuing to provide reliable electric service in areas served by the utilities of the Western States Coordinating Council."

GUIDELINES FOR LOCATING THE RIGHT-OF-WAY WITHIN SPECIFIC CORRIDORS

The applicant guidelines that follow specify company requirements relative to locating the line within the specified acceptable corridors.

Rights-of-way will be selected to minimize environmental impact and conflicts with current and future land use.

The applicant plans to protect aesthetic and scenic values within and along the rights-of-way as much as possible, consistent with authorized use of the rights-of-way.

Visual impact will be reduced by judicious selection of rights-of-way within the specified acceptable corridor. The rights-of-way will be located against natural backgrounds as seen from major view areas, if feasible. Wherever valleys, canyons or draws are involved, ridge lines and other sky panoramas will be avoided to the extent possible.

Wherever possible, the right-of-way will cross roads or highways between high points, at a dip or on a curve in the road. Long views of the line crossing highways, down canyons and valleys or up ridges and hills will be held to a minimum by varying the alignment of crossings or by concealment behind natural terrain.

The right-of-way will be located wherever possible to avoid all inhabited dwellings.

GUIDELINES FOR CONSTRUCTION OPERATIONS

Construction operations consist of field activities directed toward construction of the transmission system and peripheral activities to eliminate, minimize or mitigate adverse environmental impacts. Within this section, guidelines and commitments are presented whereby the

physical environment will be protected from undue immediate and long-term adverse impact. Public safety and protection of property will be maintained and cultural, natural and biological resources will be preserved to the greatest extent possible.

Cultural, Natural and Biological Monitoring

The applicant employs an archaeologist who will identify cultural and natural resource localities during the tower site and access road approval along the route prior to construction. Cultural and natural resource localities will be avoided to the extent possible. If a locality cannot be avoided, mitigation measures approved by the appropriate authorizing agency will be implemented by the archaeologist or under his supervision.

The applicant also employs a biologist who will identify specific biological problem areas during the tower site and access road approval operation. The recommendations of the biologist with approval of the appropriate authorizing agency will be followed and documented on specific site locations and mitigation practices implemented in problem areas as necessary.

Designated biological, cultural and natural areas will be flagged prior to the start of construction and all personnel will be instructed to report any findings suspected to be significant, whether in the designated areas or elsewhere.

In the event that any items with apparent biological, cultural or natural values are discovered during construction of the line, these relics or items will not thereafter be moved or disturbed without appropriate authority. Further construction operations in the area will be suspended until the necessary clearance has been obtained.

Title to any relics, artifacts, fossils or other items of cultural or natural value is expressly reserved to the landholder or agency having jurisdiction.

Air Quality

Construction equipment will comply with all applicable regulations related to dust, noise and gaseous emissions.

All excavations, embankments, stockpiles, access roads, tower sites, waste areas, borrow areas and other work areas within or adjacent to the project boundaries will be maintained free from dust exceeding air pollution standards or causing an extended hazard or nuisance to others.

Sprinkler trucks or other approved measures will be used to control dust whenever it constitutes a nuisance to neighboring residents or agricultural developments. The use of oil to control dust must have prior approval of the appropriate governing agencies.

Prevention of Fire Damage

Full compliance with applicable fire laws and regulations will be considered a necessity, and the applicant will comply with any fire plan submitted by the land management agency with jurisdiction over lands crossed by this project.

During construction of the transmission line in areas where fire hazards exist, all vehicles and gas-powered equipment will be equipped with spark arrestors. A fire patrolman with a pumper-equipped pickup truck will be on site where necessary. If required, fire-fighting equipment will be located in cache boxes along the right-of-way at strategic locations. All welding, grinding operations and smoking privileges will be controlled in fire danger areas. When weather conditions create an extreme fire danger, construction operations will be limited or suspended in specific areas as required by the applicable authorizing agency. The construction superintendent or general foreman will establish a project fire plan and all project personnel will be instructed as to individual responsibility in implementation of the plan.

Public Safety and Protection of Property

Construction operations will be conducted to avoid closing or obstructing any railroad, road or other property until the appropriate permits have been obtained from owners of the land or from governmental or other authorities having jurisdiction.

Operations may be required to cease during heavy rains.

All cultivated, planted areas and natural vegetation such as trees, plants, shrubs and grass on the right-of-way that do not interfere with the performance of work will be preserved and protected.

Precautions will be taken to protect, in place, all public land survey monuments and private property corners. If any such land markers or monuments are inadvertently destroyed, they will be reestablished or referenced in accordance with procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," or specifications of the county engineer in the case of private property.

Until proper authorization has been obtained, no work will be performed that would affect any existing pipeline, telephone, telegraph or electric transmission line, irrigation ditch or other structure.

Construction Related Facilities

The applicant will negotiate with property owners and appropriate governmental agencies for construction related facilities including borrow pits for road fill, and for areas for construction yards, pulling sites, and concrete batch plants. The preservation of the landscape will be a prime consideration in the location of these facilities. Such sites will be kept as small as reasonably possible and will be located in available areas of minimum vegetation and slope. Restoration and reshaping of these areas at completion of use will duplicate original condition as nearly as possible.

All portions of construction related areas will be maintained in a neat, clean and sanitary condition at all times. Portable, self-contained toilets will be furnished for use by construction workers.

Clearing and Construction of Roads, Structure Sites and Pulling Sites

Prior to any clearing, the applicant and the appropriate landowner may inspect all flagged construction road locations, areas to be cleared for structures and areas to be cleared for pulling sites.

Existing roads will be marked for use as access roads wherever feasible. Such roads may require upgrading in order to accommodate construction traffic. It is the intent of the applicant to hold construction of new roads to a minimum. All existing roads utilized during construction will be left in the same condition as originally found or better.

The applicant will submit proper application to the appropriate land management agency for the location of roads on Federal and State land.

Roads will be installed and maintained during construction in accordance with the following minimum requirements:

The minimum radius of curvature on open curves will be 50 feet (15.25 m) except where cuts or fills exceeding 50 feet (15.25 m) in vertical height are required.

The maximum sustained grade will be 12 percent for the main through road and 18 percent for spur roads to tower sites.

Cut slopes will be one-to-one in stable material.

Fill slopes will normally be one and one-half to one.

Deadend spur roads more than 500-feet (152.5 m) long will have either Y-type or circle turnabouts.

Any clearing will be restricted to the minimum necessary for the safe construction and operation of the line. Clearing of desert vegetation will be restricted to that required for placement of footings. Clearing normally will be limited to crushing brush, rather than uprooting, in assembly and structure erection areas and at pulling sites.

Structure site clearing will be limited to the minimum area required for layout of steel and assembly and erection of the structure. This will typically require an area 200-feet by 200-feet (61 m by 61 m) (0.92 acre) (.37 ha). Pulling sites will typically require an area 200-by 300-feet (61 m by 91.5 m) (1.38 acres) (56 ha). Cleared areas may be irregular in shape.

Clearing of trees will be restricted to that necessary for pulling conductors.

Leveling at structure sites will be limited to crane pads in hilly terrain. The same restrictions as apply to cut and fill on access roads will be required for these pads to affect site restoration.

Care will be taken so that erosion problems do not develop below construction sites as a result of channeling water into new areas.

Access Roads and Vehicle Movement

Vehicular traffic will be limited to approved access roads, construction yards and construction sites. No off-road travel will be allowed.

Construction foremen and personnel will be informed where construction equipment and vehicles are allowed.

Fences and Cattleguards

All fences crossed by the proposed transmission line access road will be provided with an appropriate gate or cattleguard, in accordance with agreements with the landowner. All fences crossed by access roads will be adequately braced before fencing is cut.

Herbicides

No herbicides or pesticides will be used during construction or maintenance activities.

Post Construction Cleanup and Waste Disposal

Each tower site will be kept free from accumulated waste materials and rubbish as required for safety, appearance and avoidance of fire hazards.

General cleanup will be performed in working areas for the duration of the project to prevent litter accumulation.

Disposal of effluents, trash, garbage, oil, grease and chemicals will be subject to approval of governing agencies.

Sanitary wastes will not be discharged into streams or stream beds.

Water used in material processing, concrete curing and excess concrete cleanup, as well as other waste waters, will not be discharged into surface waters.

Wasted concrete and washout from concrete trucks and batch plants will be disposed of as approved by the authorizing agency.

All noncombustible wastes such as conductor, ceramic or metal scraps will be removed to an appropriate dumping area.

GEOTECHNICAL CONSIDERATIONS

Soils

Standard road grading practices will be used to construct access roads. Berms which could potentially concentrate runoff will not be left along road flanks. Berm removal will mitigate the possibility of altering drainage patterns and concentrating runoff which could accelerate erosion. Roads will follow existing topography as closely as possible to reduce the need for large cuts and fills. Culverts will be placed across major washes, if needed. The eluvial soil horizon is sensitive to deflation and will be removed by grading access roads, hence mitigating the possibility of increased sediment load. Where collapsible soil is encountered, a suitable road treatment method will be developed with the authorizing agency to ensure construction vehicle stability. Vehicles will remain on constructed access roads in these areas.

Faulting

Transmission towers will not be placed on the trace of an active fault. The line will span the surface traces of active faults so that relative lateral surface displacement will shorten the span between towers.

Slopes

Access road and tower construction through mountainous areas may pose some problems due to steep slopes. Roads will be made with the steepest gradient possible to reduce the height of cuts and fills.

ECOLOGICAL CONSIDERATIONS

An environmental coordinator with biological training will be in the field during preliminary engineering to approve tower locations and access road alignment. The coordinator will also recommend construction scheduling and will be in the field during construction in sensitive areas. Sensitive areas may include, but are not limited to, desert tortoise habitat, Coachella Valley fringe-toed lizard habitat, bighorn sheep habitat, and areas vegetated with endangered or threatened plant species.

General Mitigation Measures

The following standard practices will be implemented to minimize impact to natural vegetative cover and faunal habitat:

Existing access roads will be used whenever and wherever feasible and construction personnel will be directed to remain within access roads, other existing roads and trails. Personnel will disturb only areas essential to construction activities.

Tower pads will not be graded except in steep or rugged terrain.

New access and spur road widths will be minimal.

Access roads will follow natural slope contours when feasible to minimize erosion.

Concrete batch plants, construction yards and construction areas will be of minimal workable sizes.

In steep terrain, appropriate engineering techniques will be used to avoid excessive accumulation of graded materials on the downslope.

This will reduce potential impact due to excess erosion, landslides and rockfalls.

If any temporary roadways are required, minimal grading will be performed in order to allow root or root crown sprouting species to reestablish more rapidly.

Tension stringing methods (including use of helicopters) will be employed to install overhead conductors, thus minimizing impacts to natural ground cover between tower sites.

Timing of construction activities in important bighorn sheep habitat will be keyed to periods that avoid lambing or other reproductive activities. Areas of particular importance along the preferred (Brenda) route include portions of the Plomosa and Dome Rock Mountains.

Wherever possible, construction activity will be avoided during the breeding season in those areas in which active nest sites of threatened or endangered bird species are observed during baseline surveys or by the construction biologist. Such species would include the endangered or threatened raptors in the mountainous areas, such as the Plomosa and Dome Rock Mountains, and the rails along the Colorado River. Although no such sites have yet been identified, field biological studies are continuing over the full annual cycle. The minimum distance from active raptor nests that intensive activity will be allowed is 1 mile.

Access roads will be routed around areas where endangered and threatened plant species are found along the transmission route. If rerouting is not possible, then transplantation of the species will be investigated with the authorizing agency.

If imperiled individuals of endangered or threatened plant species are encountered, SCE will work with the authorizing agency to determine the feasibility of collecting several of the plants for propagation in a greenhouse for later transplantation to appropriate natural habitat areas.

Routine maintenance surveys will generally be conducted by helicopter to minimize vehicular impacts on access roads.

In sensitive areas such as bighorn sheep, desert tortoise, and fringe-toed lizard habitats and areas vegetated with endangered and threatened plant species, judicious placement of fences and gates will be made to inhibit unauthorized off-highway vehicle use. For example, in rocky canyon areas, fence ends could be placed so that passage around them would be extremely difficult.

Access gates from existing highways to the transmission line right-of-way will be positioned in the least conspicuous locations to inhibit unauthorized off-road vehicle use.

Specific Mitigation Measures

Removal of protected plant species, such as saguaros, will be performed in accordance with applicable State regulations and will be minimized by bypassing whenever possible. Transplantation of removed endangered and threatened species to suitable habitat areas will be explored with the authorizing agency.

Access roads will be routed around the Chuckwalla Dune. A fence will be erected perpendicular to the line across the width of the right-of-way to help prevent ORV's from extending the access road across the dune. Plus, the dune will be spanned by the overhead line so that no towers will impact the integrity of the biological system in the dune.

Timing of construction activities in important bighorn sheep habitat will be keyed to periods that avoid lambing or other reproductive activities. Areas of particular importance along the Brenda Route include portions of the Plomosa and Dome Rock Mountains.

Provision and maintenance of new watering places for bighorn sheep in strategic locations near the transmission line route (e.g., Plomosa and Dome Rock Mountains) may be a valuable mitigation measure. Provision of such facilities would have to be coordinated with other construction projects in these areas, such as the SOHIO pipeline. The applicant will work with the authorizing agency to determine the location of such new watering places. Long-term maintenance of such watering facilities is assumed by the applicant to be the responsibility of the authorizing agency.

CULTURAL AND NATURAL RESOURCES

The applicant has already taken mitigative action in two areas of the Brenda Route by realigning to a longer but less impacting route in order to bypass the archaeologically sensitive areas near the Mule Mountains (California side) and the Ranegras Plains (Arizona side). Similar realignments will be considered if future studies reveal significant resources. The applicant proposes to undertake the following set of actions to further reduce potential impacts of the proposed project on cultural and natural resources of the study area.

If a route for the Palo Verde-Devers Transmission Line is approved, the applicant will stake all locations where potential ground surface disturbance may occur, including the route centerline, tower sites, new access roads, construction yards, equipment yards, pulling stations,

etc. A full 100 percent intensive cultural resource inventory will be conducted by an archaeologist (acceptable to the BLM) in all areas where surface disturbance will occur except those areas where it can be demonstrated to the satisfaction of SCE, BLM, and other relevant agencies that additional inventory work is not required. Portions of the staked alignment that traverse areas of potential natural resource sensitivity, as identified by SCE consultants, will be surveyed for natural resources by professionals. The data from these surveys will be utilized by the applicant in locating individual transmission line towers, access roads and other project related ground disturbing activities.

Once all areas subject to ground disturbing activity have been marked on the ground, each transmission line tower site, new access road segment and other areas subject to surface disturbance will be inspected by a qualified archaeologist. The applicant's objective in so doing is to avoid direct impact on cultural and natural resources.

In instances where it is impractical to avoid direct impact to a resource, appropriate physical mitigation measures (excavation, surface collection, etc.) will be implemented depending on the character of the resource in question. Physical mitigation will only be utilized in instances where it is impractical to avoid impact to a resource.

In an effort to reduce indirect impacts of increasing public access to culturally and naturally sensitive areas, the applicant will attempt to route new access roads as far as reasonably possible from resource localities. Consideration will be given locked gates on access roads where this will be effective in reducing public access and where landowner consent has been given.

Construction personnel will be advised of local, State and Federal laws regulating disturbance of cultural and natural resources. The applicant will use its best efforts to prevent any vandalism or artifact collection by the applicant's personnel or subcontractors.

A system of flagging sensitive areas to be avoided by construction activities will be developed. Such areas will be flagged immediately prior to construction and flagging will be removed immediately following construction. The flagging system utilized will be designed to be conspicuous only to appropriate personnel. Public attention will not be attracted.

In areas where there is a high probability of unrecorded cultural or natural resources occurring below ground surface, onsite monitoring of ground disturbing construction activities will be provided. Monitors will be qualified professionals in the discipline appropriate to the potential resource. In addition, SCE archaeologists will undertake periodic monitoring of construction activities.

LAND USE

All of the alternative routes include sections which traverse existing agricultural land including prime and unique farmlands under cultivation.

Where possible, SCE will place towers and access roads along existing section lines and roads on field boundaries to minimize potential interference of transmission towers and lines with crop dusting, irrigation and other operations. Alternate tower design, such as two-legged structures, may be useful to reduce impacts. The above measures will also minimize operating interference, severance of property, and possible withdrawal of agricultural lands from production.

VISUAL

Towers, conductors and telecommunications facilities will have dull or nonspecular finishes to minimize visual impacts when they are located in or near areas of high scenic values.

SAFETY

Safety is a primary concern in the design of this 500 kV transmission system. The transmission line will be protected at both ends with circuit breakers. These breakers would be connected to the relaying system minimizing the possibility of electrical shock or fire in the event of either a single conductor or multiple-conductor failure. If such a failure occurs, power will be automatically and rapidly removed from the line. Lightning protection is provided by overhead groundwires along the line and by grounding circuits in substations. Electrical equipment and fences associated with the substation will be connected to a common ground.

In accordance with good safety practice, all fences and metal gates crossing or within the right-of-way will be grounded to avoid the electrostatic and electromagnetic voltages present during line operation.

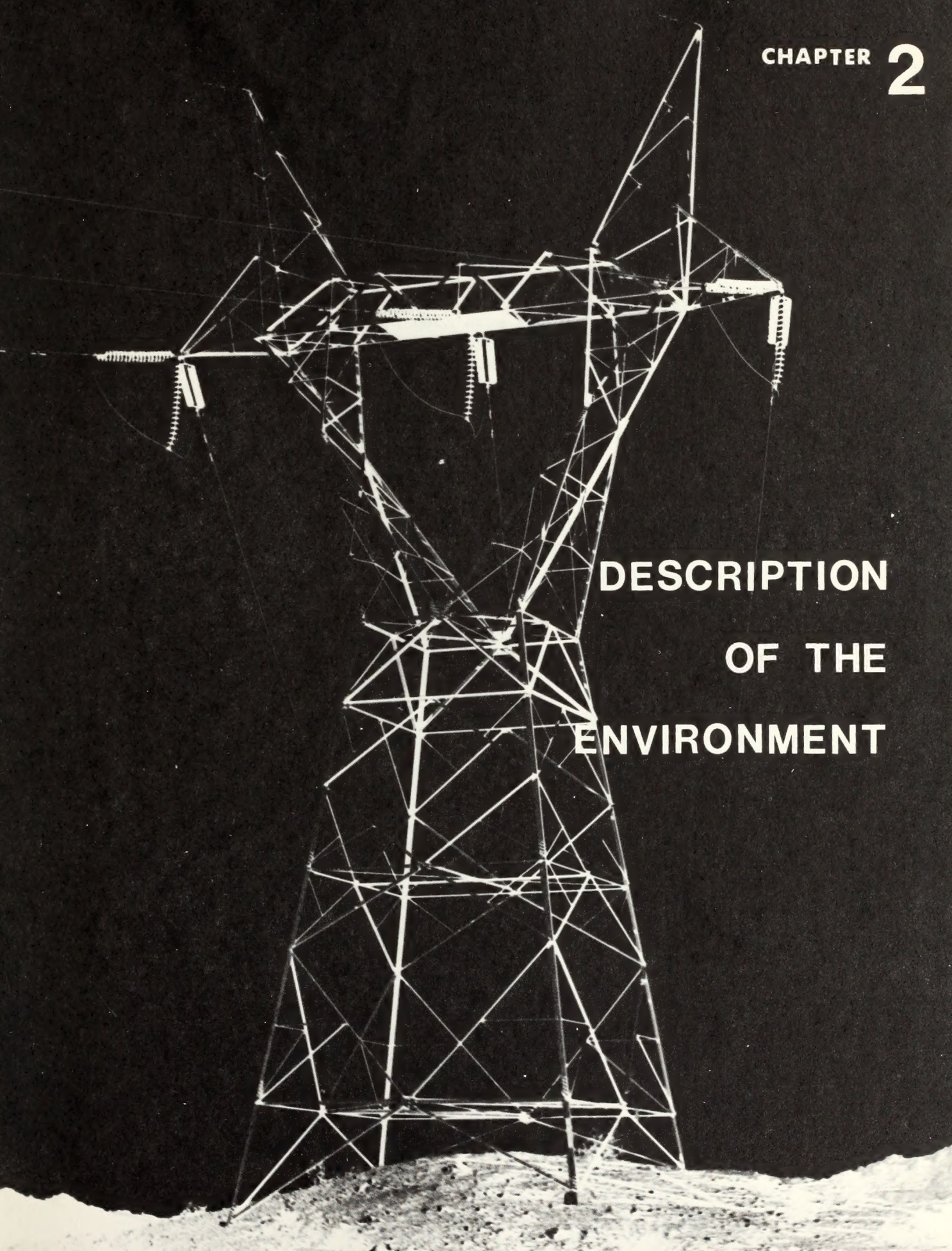
ELECTRICAL EFFECTS

Most of the mitigating features concerning electrical effects are inherent in the design of the line itself. By appropriate selection and optimization of certain design parameters, the line will operate within acceptable levels and audible noise and radio and television interference will be kept to a minimum. Some of these parameters are conductor diameter, number of conductors per bundle, bundle spacing, phase spacing,

minimum ground clearances, right-of-way width, and routing the line to avoid critical locations or heavily populated areas. All line hardware is manufactured to meet national standards which call for corona-free operation at design voltage. In addition, the natural aging of the conductors with time helps reduce corona and keep electrical effects at a minimum.

All design parameters were selected to meet acceptable criteria within the utility industry.

CHAPTER 2



DESCRIPTION OF THE ENVIRONMENT

CHAPTER 2

DESCRIPTION OF THE ENVIRONMENT

INTRODUCTION

The following is a description of the environment as it presently exists. Data are presented on both area and corridor bases. The area described varies in width from about 12 to 30 miles (19 to 48 km) and extends from the PVNGS west of Buckeye, Arizona, to the Devers Substation north of Palm Springs, California. The corridors studied follow the various alternate and subalternate routes under consideration and are 2-miles (3.2 km) in width (see map 1-1).

CLIMATE

The climate of Southern California and Western Arizona within the study area is typical of the Sonoran and Mohave Deserts of the southwestern United States. It is characterized by high daytime temperatures, low relative humidity, and low average precipitation.

Temperatures from June through September can be severe. Temperatures in excess of 120 degrees F. (49 degrees C.) have been recorded at several locations. The mean daily maximum temperature ranges from the upper 60's F. (18-20 degrees C.) in winter to approximately 105 degrees F. (41 degrees C.) in summer months. The mean daily minimum temperatures range from the mid 30's F. (1-2 degrees C.) in winter to the upper 70's F. (24-26 degrees C.) and lower 80's F. (27-29 degrees C.) in midsummer.

This southwestern desert region is characterized by its biseasonal precipitation periods. Summer rains (July through September) are produced from moisture which comes almost entirely from the Gulf of California. Rain showers commonly are light and of short duration, 30 minutes or less. Intense storms of 1 to 2 inches, (25.4 to 50.80 mm) lasting for several hours occur occasionally. These storms are primarily convectional in nature and are characteristically local rather than widespread. Most storms have a diameter of less than 3 miles (5 km).

Most record summer rains in the past century have been associated with surges of tropical air from the Gulf of California and the Pacific Ocean. These storms, which occur in late August and September, usually originate as tropical hurricanes off the west coast of Mexico. This condition occurs about once in 5 years.

The winter precipitation (December through February) results from storm fronts that develop in the Pacific Ocean. These fronts are usually widespread, gentle, and may last for several days.

The annual average rainfall ranges from approximately 3.5 inches (89 mm) near Indio, California, to approximately 8 inches (203 mm) near the PVNGS site.

High summer temperatures are tempered by low relative humidity. Daytime humidity readings of 5 to 10 percent are common.

Winds in the study area are strongly dependent upon the surrounding topography. Mountains and valleys channel winds and produce local terrain variations on regional wind patterns. Wind speeds are generally low except during storm frontal periods and thunderstorms.

AIR QUALITY AND NOISE

AIR QUALITY

Air quality data is scarce in the study area because most of the region is sparsely populated desert.

The extreme western and eastern margins of the study area have been designated by the Environmental Protection Agency (EPA) as areas potentially exceeding National Air Quality Standards. In 1975 at locations in Indio and Palm Springs, California, air quality standards were exceeded for oxidants 99 and 94 days respectively, and total suspended particulates were exceeded 285 and 32 days respectively (California Air Resource Board).

In 1975, at Buckeye, Arizona, near the proposed routes, air quality standards were exceeded for oxidants and particulates. Records reflect maximum concentrations, but not number of days (Arizona Department of Health Services). Sulfur dioxide and nitrogen dioxide are relatively insignificant problems in this area. The relatively high concentrations of particulates at Buckeye, Arizona, and Indio, California, were probably due to localized blowing dust.

Weather records for the study area indicate that inclement weather occurs approximately 9 percent of the time. Storms are most frequent during periods from July to September and December to March.

NOISE

Ambient audible noise measurements were made at 20 separate sites along the proposed Brenda transmission corridor. Mean audible noise level was 40 dB (A). During rain, ambient noise levels increased 10-20 dB (A) above the mean. Most noise along the routes results from natural rather than man-made sources. Excursive noise levels in populated areas were higher, but typically of short duration.

WATER RESOURCES

SURFACE

The study area is one of limited rainfall. With the exception of the Colorado River, all streams in the study area are intermittent or ephemeral, flowing only after localized summer thunderstorms or during winter cyclonic storms. Wash channels increase in size in descent attaining maximum width at slopes of about 1 percent. When slopes approach 0.5 percent, the flows can no longer sustain heavy bedload transport, and channels fan or braid into smaller ill-defined washes. Bedload deposits remain in the drainage pattern and result in constant shifting of channels.

The names of the major valleys within the study area, their main drainages, directions of flow and termination points are presented in table 2-1. Locations are shown on major drainages within the study area, map 2-1.

Most flooding in the study area, other than that through narrow canyons, is shallow by way of sheetflow resulting from local storms. Published data from the U.S. Geological Survey (USGS) indicates that the flood-prone area around Centennial Wash ranges from 1 to 2-1/2-miles (1.6 to 4.2 km) wide for a 100-year flood (although this may change when new flood control structures in this area are completed).

The flood plain contiguous to the Colorado River varies from 3 to 9 miles (4.8 to 14.5 km) in width. It is about 3-miles (4.8 km) wide at the Palo Verde Dam, and increases to about 9-miles (14.5 km) wide in Palo Verde Valley. In Cibola Valley, the flood plain is between 3 and 4-miles (4.8 and 6.4 km) wide and then it narrows to less than 1 mile (1.6 km) in the bedrock narrows below Cibola. Tyson, Bouse, and McCoy Washes may flow during rainy seasons. Tyson Wash has a more distinct drainage, and the flood-prone area around Tyson for a 100-year flood appears to be approximately one-half mile (.8 km) on either side of the wash. (Bureau of Reclamation Survey.)

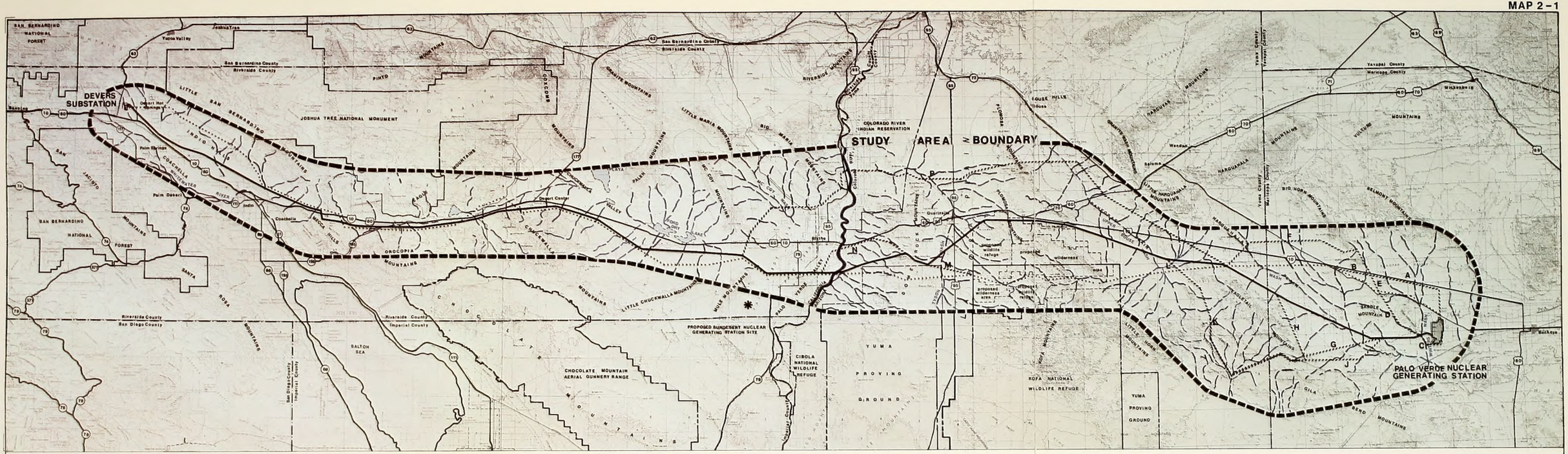
TABLE 2-1

MAJOR DRAINAGES WITHIN THE STUDY AREA

VALLEY	MAIN DRAINAGE	DIRECTION OF FLOW	TERMINATION
Palen	Unnamed	S	Palen Dry Lake
Chuckwalla	Unnamed	SE-E	Ford Dry Lake and Colorado River
Palo Verde Mesa	Unnamed	E	Colorado River
	McCoy Wash	SE	Colorado River
Palo Verde and Parker	Colorado River	S	Gulf of California
La Posa Plain	Tyson Wash	N-NW	Colorado River
Ranegras Plain	Bouse Wash and Upper Bouse Wash	NW-W	Colorado River
Harquahala Plain	Centennial Wash	SE	Gila River
Hassayampa Plain	Jackrabbit Wash	SE	Hassayampa River
McMullen	Centennial Wash	SW	Gila River
Butler	Cunningham Wash	SW	Bouse Wash
Coachella	Whitewater River	SE	Salton Sea

NOTE: The Colorado River is the only permanent drainage; all others are ephemeral rivers, washes and lakes.

Source: U.S. Geological Survey



ROUTES UNDER STUDY

BRENDA _____

KOFA .....

SUBALTERNATES .....

A

LEGEND

--- EPHEMERAL STREAMS

EPHEMERAL LAKES

COLORADO RIVER

SOURCE: APPLICANT

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

DRAINAGE

A small number of springs flow in the mountains on both the California and Arizona sides of the study area. The flow from these is not great and varies from season to season.

SUBSURFACE

Groundwater moves from highlands, where it infiltrates pervious zones or fractures, and then migrates to alluvial basins. In California, it is typically stored in alluvial basins consisting of Plio-Pleistocene lake sediments interbedded with unconsolidated gravelly fan deposits. The alluvial basins generally are within structural bedrock troughs. Many of these troughs are closed, some drain into the Colorado River. In Arizona, alluvial sediments in the basins are unconsolidated or poorly consolidated. Water moves very slowly through reservoir rocks, generally a few tens to hundreds of feet per year in permeable sediments; movement decreases to a few inches per year in materials of low permeability.

Irrigation and livestock are the primary consumers of groundwater in the study area. In urban areas groundwater is used for domestic purposes. If more groundwater is pumped than is restored, an overdraft situation occurs and subsidence cracks may develop. Subsidence cracks are evident in the vicinity of Burnt Mountain in northern Harquahala Plain. In that area the water table has been lowered 200 feet (61 m) in the last 25 years due to extensive pumping for irrigation.

The Colorado River, Ranegras, and Harquahala flood plains usually have high groundwater levels; that is, depths less than 100 feet (31 m). A description of groundwater quantity and quality within the major basins in the study area can be found on file at the Yuma District Office of the BLM.

TOPOGRAPHY

Portions of four physiographic provinces or sections are found within the study area. These are the Sonoran Desert section of the Basin and Range province, the Mohave Desert, the Transverse Ranges, and the Salton Trough. In Arizona, the Sonoran Desert section of the Basin and Range province extends west to the area of Bouse Wash; the Mohave Desert province extends from the vicinity of Bouse Wash to the Eagle Mountains; the Transverse Ranges province extends from the east side of the Eagle Mountains to the east side of Coachella Valley; and the Salton Trough encompasses the remainder of the study area. The names and locations of mountain ranges and valleys can be found on map 1-1 of the Study Area. More detailed descriptions of each physiographic province are on file at the Yuma District Office of BLM.

The mountain ranges in the study area generally are between 3,000 and 4,000 feet (915 and 1,220 m) in elevation, while valley elevations range between 200 and 1,000 feet (61 and 305 m). In Arizona, natural passes through the Dome Rock, Kofa, and Plomosa Mountains are present.

ACCIDENTS AND ENVIRONMENTAL HEALTH

Construction of the Palo Verde-Devers transmission line will entail the use of numerous construction vehicles and equipment, and when the system is energized potentially dangerous electrical voltages will be present. Therefore, there is potential for serious accidents and fatalities, particularly to workers building the line and ancillary facilities.

Construction workers will also be subject to potential health hazards due to intense heat (summer temperatures often exceed 110 degrees F. (43 degrees C.) during summer months in the study area).

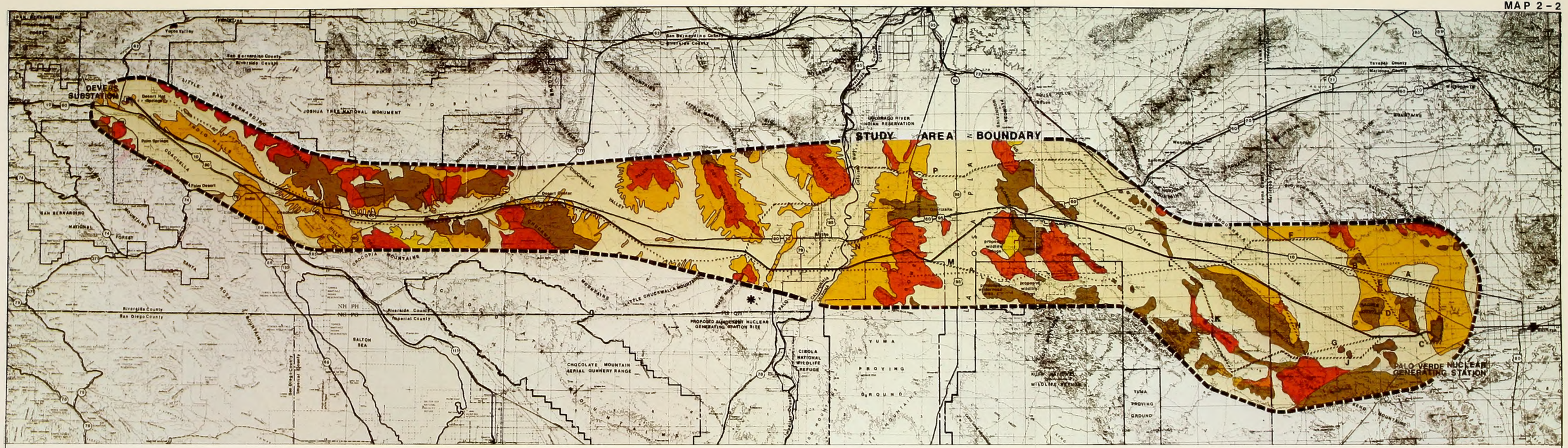
Fugitive dust may reach hazardous levels during brief periods of construction.

Coccidioides immites, which produces valley fever, may be present in soils between the generating site and Devers. Valley fever is a respiratory disease which may be mild in many cases, but which can lead to hospitalization or death (Leathers, 1977). Coccidioides immites has been collected in the vicinity of Blythe and Palo Verde, California, (Swatek and Plunkett, 1956). The desert fever pathogen is transmitted by dust.

GEOLOGY AND MINERAL RESOURCES

GEOLOGY

The rock types exposed in the study area are very diverse. They range in age from Precambrian to Recent. The geology of each mountain range is addressed in map 2-2. Areal geology has been separated on this map into five broad categories: alluvium, nonindurated sedimentary, indurated sedimentary, igneous, and igneous and metamorphic complex. All recent fluvial and eolian deposits are shown as alluvium. The nonindurated sedimentary formations are predominantly Plio-Pleistocene, older alluvial fan assemblages in the desert regions. All other deposits exhibiting little or no cementation are also included in this group. The indurated sedimentary category comprises all bedded and massive sedimentary rocks, such as shale, sandstone, and conglomerate. Granitic and volcanic rocks are combined to make up the igneous category. Selected faults, most of which are probably active, and earth-



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MILES

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KILOMETERS

ROUTES UNDER STUDY
BRENDA
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SUBALTERNATES
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LEGEND

- ALLUVIUM: Quaternary alluvium, sands
- SEDIMENTARY: non-indurated
- SEDIMENTARY: indurated
- IGNEOUS: granitic and volcanic
- IGNEOUS AND METAMORPHIC COMPLEX

SOURCE: APPLICANT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

GENERALIZED GEOLOGY

quake epicenters within the study area are shown on the Selected Faults with Seismicity Map 2-3.

MINERAL RESOURCES

The major metallic and nonmetallic minerals in the study area are presented in table 2-2. The Land Use Areal Map 2-4, shows the location of the deposits. In addition, a map prepared by the USGS showing supplemental minerals data is presented in the appendix of this report, and a listing of the mineral localities by township and range is given. Additional minerals information is on file at the Yuma District Office of the BLM. Many mining claims have been staked within the study area, and their concentration is probably greater in areas designated as mineral localities on the map.

Numerous metallic and nonmetallic mineral deposits within the study area have been identified primarily in areas of exposed bedrock in mountain regions. Some placer deposits also have been discovered. Gold, copper and iron are the predominant metallic minerals mined in California; however, sand, gravel and rock products are the most actively mined mineral resource. Approximately 5 million short tons of sand and gravel per year have been mined from Riverside County, California, alone. Most of the metallic-mineral deposits are currently uneconomic to operate and have been abandoned. A notable exception is the Eagle Mountain Iron Mine located northwest of Desert Center, California. Kaiser Steel Corporation is the operator.

Metallic deposits in Arizona include copper, manganese, gold, silver and iron. Metallic ore deposits dominate Arizona's mineral resources, however, within the study area nonmetallic deposits of barite, bentonite, sand and gravel are most plentiful. Rockhounding for gem stones, such as opal and agate, also occurs. The potential for these stones is greatest where volcanic rocks are present, such as in the Plomosa, Kofa, and New Water Mountains.

There are no known deposits of oil, gas, or coal within the study area.

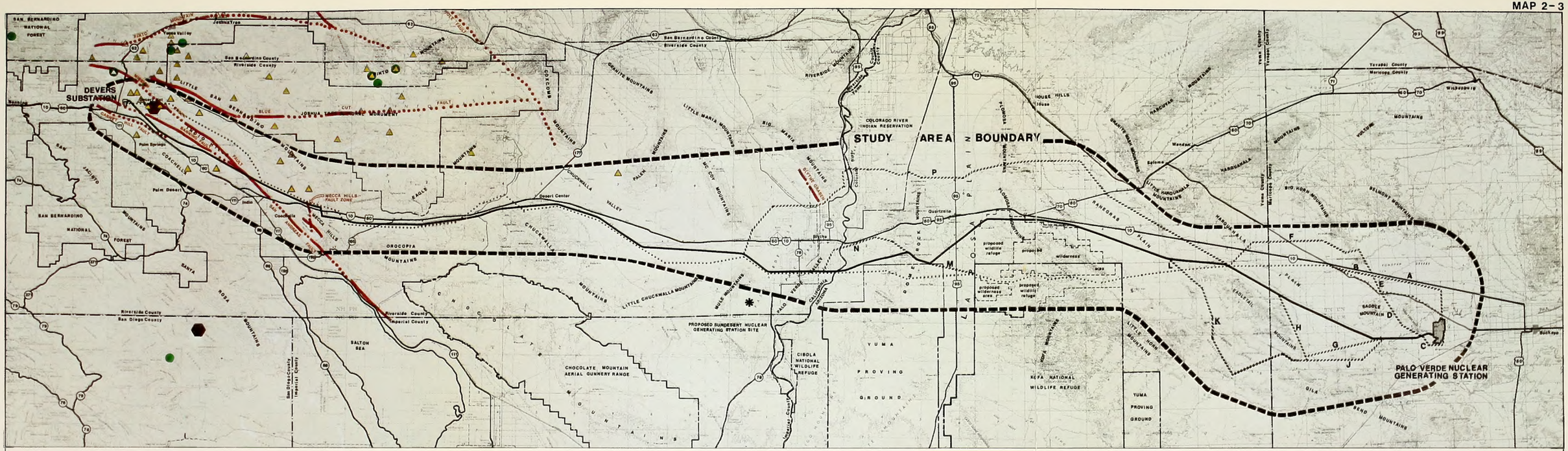
There is a Known Geothermal Resource Area (KGRA) in the vicinity of the Salton Sea, south of the study area. KGRA's are Federal lands, so designated by the USGS on the basis of: (1) hydrothermal activity, (2) encouraging geologic structure or thermal information, and/or (3) overlapping competitive interest in open filing. If developed, these areas would represent a potential for electrical generation.

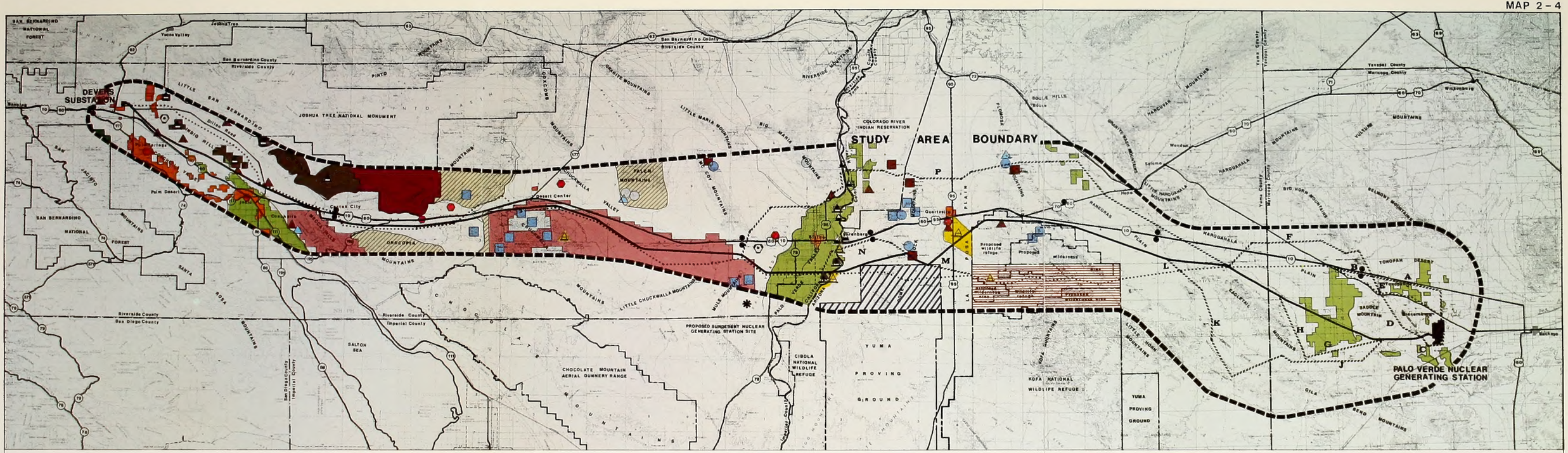
TABLE 2-2

MINERAL LOCALITIES

Mineral Resource	Locality
Sand, gravel, rock products	Indio Hills, Coachella Valley, Big Maria Mountains, alluvial apron of the Dome Rock Mountains, La Posa Plain, Plomosa Mountains, Harquahala Mountains
Barite and Bentonite	Plomosa Mountains, Ranegras Plain, McMullen Valley, Harquahala Plain, Mecca Hills, Palen Valley
Gold and Silver	Pinto Mountains, Eagle Mountains, Chuckwalla Mountains, Mule Mountains, Riverside Mountains, Dome Rock Mountains, Plomosa Mountains, Harquahala Mountains, and New Water Mountains
Copper	McCoy Mountains, Palen Mountains, Pinto Mountains, Dome Rock Mountains, Plomosa Mountains, Little Harquahala Mountains
Iron	Eagle Mountains, Palen Mountains, Big Maria Mountains, Plomosa Mountains
Manganese	Little San Bernardino Mountains, Palen Mountains, McCoy Mountains, Little Maria Mountains, Dome Rock Mountains, Plomosa Mountains, Ranegras Plain, Harquahala Mountains, Granite Wash Mountains

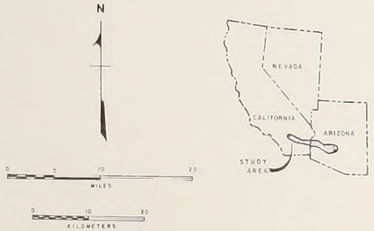
Source: Applicant


DEVERS SUBSTATION
STUDY AREA BOUNDARY
PALO VERDE NUCLEAR GENERATING STATION
PROPOSED SUNDESERT NUCLEAR GENERATING STATION SITE
COLORADO RIVER INDIAN RESERVATION
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
YUMA PROVING GROUND
CIBOLA NATIONAL WILDLIFE REFUGE
KOFA NATIONAL WILDLIFE REFUGE
SAN BERNARDINO NATIONAL FOREST
SALTON SEA
OROCOPIA MOUNTAINS
LITTLE CHUCKWALLA MOUNTAINS
CHUCKWALLA MOUNTAINS
MECCA HILLS FAULT ZONE
BANNING FAULT
SAN ANDREAS FAULT
SAN JACINTO FAULT
BLUE CUT FAULT
EARTHQUAKE VALLEY FAULT
PINTO MOUNTAIN FAULT
JOSHUA TREE EARTHQUAKE MONUMENT
Riverside County
San Bernardino County
Imperial County
San Diego County
Yuma County
Maricopa County
Pinal County
Yavapai County
Palm Springs
Palm Desert
Indio
Coachella
Desert Center
Blythe
Quartzsite
Wenden
Salome
Aguila
Wickenburg
Buckeye
Gila Bend
Tacna
Roll
Dome
Ligurta
Saddle Mountain
Eagletail Mountains
Kofa Mountains
Little Horn Mountains
Harquahala Mountains
Big Horn Mountains
Belmont Mountains
Granite Mountains
Little Maria Mountains
Big Maria Mountains
Mc Coy Mountains
Palen Mountains
Eagle Mountains
Riverside Mountains
Whipple Mountains
Mule Mountains
Trigo Mountains
Castle Dome Mountains
Rawhide Mountains
Plomosa Mountains
House Hills
Granite Wash Mountains
Little Harquahala Mountains
Harcuvar Mountains
Vulture Mountains
Hassayampa Plain
Ranegras Plain
Gila River
Colorado River
Scrub Creek
Palo Verde Mountains
Palo Verde Valley
Chuckwalla Valley
Pinto Basin
Joshua Tree
Twentynine Palms
Yucca Valley
Morongo Valley
Cabazon
Banning
Beaumont
Redlands
Riverside
Corona
Norco
Mira Loma
Ontario
Pomona
Chino
Fontana
Rialto
San Bernardino
Colton
Loma Linda
Highland
Yucaipa
Calimesa
Cherry Valley
Calimesa
Beaumont
Banning
Cabazon
Indio
Coachella
Thermal
Mecca
Oasis
Desert Center
Eagle Mountain
Blythe
Ripley
Palo Verde
Cibola
Quartzsite
Tyson
Wickenburg
Wenden
Salome
Aguila
Arlington



LEGEND

- URBAN
- AGRICULTURAL
- AIR PORTS
- VORTACS
- SAND, GRAVEL AND ROCK
- BARITE AND BENTONITE
- GOLD AND SILVER
- COPPER
- IRON
- MANGANESE
- MILITARY RESERVATIONS
- SAN BERNARDINO NATIONAL FOREST
- JOSHUA TREE NATIONAL MONUMENT
- KOFA NATIONAL WILDLIFE REFUGE
- NATIONAL RECREATION LANDS
- CANDIDATE NATURAL AREAS
- FEDERAL CAMPGROUND OR RECREATION AREAS
- STATE & COUNTY CAMPGROUND OR RECREATION AREAS
- PRIMITIVE NATURAL AREAS (PROTECTIVELY MANAGED)
- PRIVATE CAMPGROUND
- REST AREAS



ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

SOURCE: BLM TEAM & APPLICANT

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

LAND USE AREAL

GEOLOGICAL HAZARDS

Landslides and rock falls present hazards where routes are in close proximity to mountain fronts or in steep-walled valleys. These hazards are increased on the California side of the study area near the Salton Trough and Transverse Ranges where faulting is common. Debris flows caused by flash flooding may also be a problem in this area or in other mountainous locations such as the Dome Rock, Plomosa, and Kofa Mountains.

Seismic data for the study area along with selected faults have been plotted on map 2-3. It shows the location of all earthquakes with Richter magnitude ranges of 4.0 to 8.0 occurring between 1901 and 1975.

The seismicity on the Arizona side of the study area is generally very low. Most activity is found on the California side in the Salton Trough, Transverse Ranges and Western Mohave Desert. This activity reflects strain adjustment adjacent to a presently active plate boundary, the San Andreas Fault system.

Slope stability pertains to the ability of a natural or man-made slope founded in soils or bedrock to retain its form. The stability of a slope is a function of the physical characteristics of the soils or bedrock materials and orientation of geologic structure relative to slope inclination and direction. Slope failures occur in several forms including landslides, rock falls, and debris flow.

SOILS

Most of the soils in the study area will fall into two of the ten soil orders, Entisols and Aridisols. Technical soil terms are defined in the glossary.

Detailed soil survey has been completed for only one-fourth of the area. Because of this limited soils information, only five suborders were identified. The suborders are Argids, Orthents, Orthids, and Fluvents-Psamments.

All of the soils at the suborder level have similar soil properties. The suborder (Orthids) soils were further divided on the Soil Association Map 2-5, to show relative positions on the landscape, relationship with different soils and differences in erosion hazard potential.

Map 2-5 shows where the five suborders occur in the study area.

DESERT SOILS

Desert soils are fragile and some soils (Fluvents and Orthids) become very unstable when surface and vegetation are damaged or disturbed.

Erosion and collapse of desert soils relates primarily to the age of the soils. Soil age may be approximated through visual observation of landforms and geology maps.

In summarizing the soil data, there is a close relationship between landforms and soils within the study area. A soil profile is often absent or poorly developed in mountainous or upland areas with steep slopes and rock outcroppings. These areas are characterized by the undeveloped Entisols (Orthents shown on map 2-5). The most extensive Entisols occur on young alluvial fans, flood plains (Fluvents), local sand dunes, and large washes (Psamments). Because of their limited distribution, Psamments are not separated from Fluvents on map 2-5.

The soil order Aridisol usually occurs on the high to intermediate alluvial fans which flank major mountain ranges. (See map 2-5.) The lower and some intermediate alluvial fans have developed calcareous soils with only an incipient profile, usually a Cambic or Calcic Horizon (Orthids).

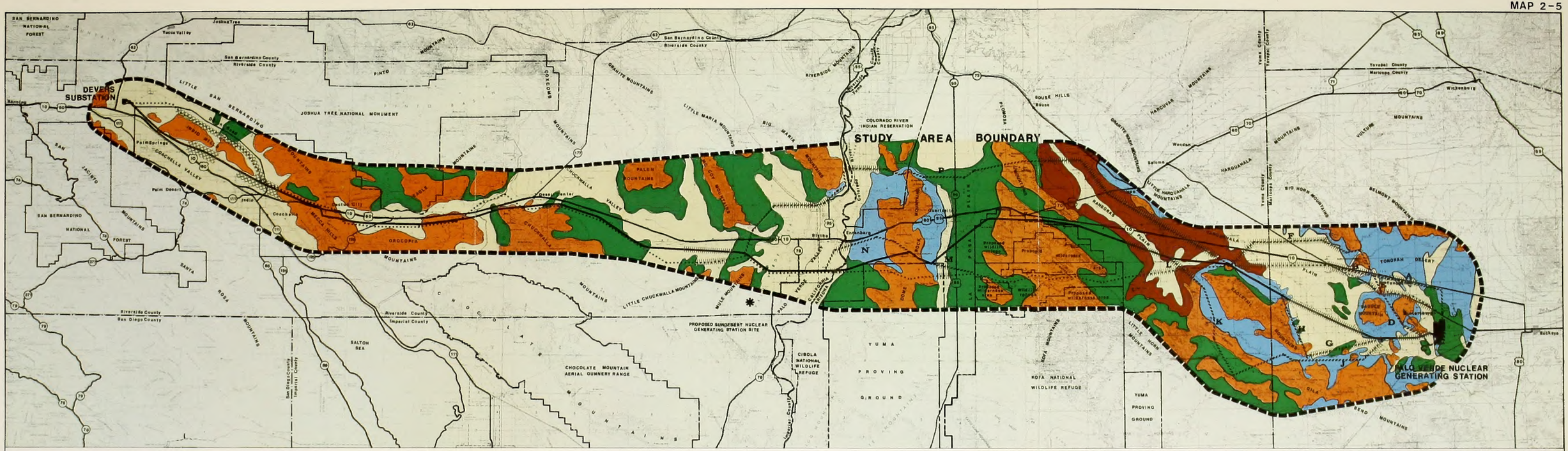
Some Argids and Fluvents are included with the Orthids because of their limited distribution. The high level fans and some intermediate fans contain Argids. (See map 2-5.) Typically, Argids have a distinct clay or clay loam horizon.

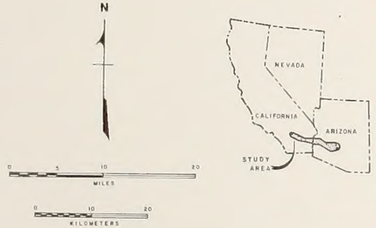
SOIL EROSION

The principal erosion agent of the desert is water rather than wind. Although annual precipitation is low much of the rain comes in the form of violent thunderstorms which exceed the absorption rate, thereby creating severe surface runoff. During periods of heavy rainfall, desert soils having a clay or clay loam surface tend to seal over and facilitate surface runoff.

Erosion is affected by vegetative cover, slope, soil texture and rainfall intensity. If protective ground cover and soil surface are damaged or disturbed, soil erosion rate will accelerate.

Soil erosion is extreme in some areas of the Entisols (Fluvents and Psamments).





ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

ENTISOLS

- RESIDUAL SOILS IN UPLAND INCLUDES ROCKLAND, BADLAND (ORTHENTS WITH ARGIDS AND ORTHID INCLUSIONS.)
- ALLUVIAL SOILS ON FLOODPLAINS AND FANS (FLUVENTS AND PSAMMENTS WITH ARGIDS INCLUSIONS.)

ARIDISOLS

- SOILS ON INTERMEDIATE TO HIGH ALLUVIAL FANS AND PEDIMENTS, WITH A CAMBIC & CALCIC HORIZON (ORTHIDS.)
- SOILS ON LOW TO INTERMEDIATE ALLUVIAL FANS WITH A CAMBIC & CALCIC HORIZON (ORTHIDS WITH ARGIDS AND FLUVENTS INCLUSIONS.)
- STRONGLY DEVELOPED SOILS ON HIGH TO INTERMEDIATE ALLUVIAL FANS AND PEDIMENTS. (ARGIDS WITH PETROCALCIC AND DURIPAN INCLUSIONS.)

HIGH SOIL HAZARDS AREAS

- SOIL EROSION, COMPACTION, COLLAPSE AND DUST.
- SHEET AND RILL EROSION (CALIFORNIA ONLY)

SOURCE: SOILS BOUNDARIES AND SOIL HAZARDS ARE GENERALIZED FROM FIELD SPOT CHECKS, RECONNAISSANCE AND GENERAL SOIL ASSOCIATION MAPS, AND DETAILED SOILS MAPS PUBLISHED BY THE SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE.

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

SOIL ASSOCIATIONS

Five soil erosion classes were identified in the study area. Soil erosion ranges from high in the Fluvents and Psamments to low-medium in the Argids. Soil Conservation Service (SCS) erosion guidelines were used in determining the potential erosion classes. A summary of potential soil erosion classes by Order and Suborders, and a brief description of the major soil and terrain characteristics are given in Potential Soil Erosion Classes Table 2-3. Areas of Fluvents and Psamments soils that have high erosion potential are depicted on map 2-5.

SOIL COLLAPSE

Soil collapse may be caused either by overloading the soil during construction or by hydrocompaction. Hydrocompaction occurs when large amounts of water are introduced into a normally dry hard sediment. Clays and silty clay soils are most susceptible. Soil collapse has displaced canals, bridges and irrigation structures in the San Joaquin Valley in California. (Bull 1961, 1964; Meade 1968.)

Some Argids and Fluvents soils have the potential to collapse when overloaded with heavy equipment. The Argids soils generally occur on high to intermediate alluvial fans and typically have a varnished desert pavement. These Argids usually have an eluvial silty horizon immediately below the desert pavement. This horizon ranges in thickness from 1 to 6 inches (2.54-15.2 cm). Overloading the silty layer will cause some soil collapse upon initial wetting. Low to moderate water and wind erosion may occur when the desert pavement has been disturbed by construction activities. The Chuckwalla Valley, La Posa Plain and Ranegras Plain contain Argid soils that have the greatest potential for collapse. Fluvents soils with a high potential for collapse are depicted on map 2-5.

SOIL COMPACTION

Soil compaction by construction activities will occur in all soils but will be greater in some of the Fluvents soils because these soils have a clay, clay loam and silty clay surface layer. The largest areas of these soils are depicted on map 2-5.

SOILS SUMMARY - BRENDA AND KOFA 500 KV CORRIDORS

Orthents soils represented by badland, rockland and mountain land comprise 14.2 percent of the Brenda corridor and 13.0 percent of the Kofa corridor between the plant site and Devers. (Badlands and rocklands as used in this context refer to miscellaneous land types and include the Orthents soils. They are dominantly soil and are capable of supporting a variety of plants.) See Soil Association Summary, Table 2-4.

TABLE 2-3

POTENTIAL SOIL EROSION CLASSES

EROSION CLASSES	SOIL ORDER (SUBORDERS)	REPRESENTATIVE TERRAIN CHARACTERISTICS
High	Entisols (Fluvents and Psamments)	Sand, silt, clay sediments--subject to soil erosion when disturbed. A-C profile usually calcareous. Sand dunes, sandy areas adjacent to playa lakes--e.g., Ford and Palen Dry Lakes--and Bouse, Tyson, Winters, and Centennial Washes, Arizona; and areas adjacent to the Colorado River.
Low to Medium	Entisols (Fluvents and Psamments)	Sand, silt and loam sediments on flood plains, terraces, and alluvial fans, A-C profile, usually calcareous. Harquahala Valley, Ranegras Plain, Arizona; Palo Verde Valley, Chuckwalla Valley, Coachella Valley, and North Palm Springs area, California. (Some Argids included.)
Medium to High	Entisol Orthents	Rockland and mountainous areas. Dominantly steep, cobbly or stony, well-drained, shallow soils. Badland topography--Indio and Mecca Hills.
Medium	Aridisol (Orthids)	Very gravelly or gravelly loam or sandy loam surface. Intermediate to low alluvial fans. Characterized by a cambic or calcic but not an argillic or petrocalcic horizon. Moderately stable. Tonopah Desert, Arizona; flanking the Saddle, Eagletail, Bighorn, and Dome Rock Mountains, Arizona.
Low to Medium	Aridisol (Argid)	Very gravelly silt loamy surface characterized by desert pavement, A2 eluvial horizon, argillic horizon, calcic, petrocalcic and duripan horizon. Stable surface on high to intermediate alluvial fans. Subject to collapse under heavy loads. Flanking the Palen, Chuckwalla, and McCoy Mountains in California; the Kofa and Dome Rock Mountains and La Posa Plain in Arizona.

Source: BLM Team

TABLE 2-4

SOIL ASSOCIATION SUMMARY
500-kV Corridors, Plant Site to Devers

SOIL ASSOCIATION (Suborders)	SURFACE TEXTURES	CORRIDOR LENGTH MILES	(ha)	PERCENT OF TOTAL	(1) PERMANENTLY OCCUPIED ACRES	(ha)	TEMPORARILY DISTURBED ACRES	(ha)
BRENDA ROUTE								
Orthents, 5 to 90 percent slopes	Very gravelly and very cobbly loams. Rock outcroppings.	32	(51)	14.2	80	(32)	198	(80)
Fluvents and Psamments, 0 to 10 percent slopes	Gravelly sands, loams silty clays, and sandy loams.	120	(193)	50.4	281	(114)	702	(284)
Orthids, 0 to 5 percent slopes	Sandy loams and loams.	8	(13)	3.4	19	(8)	47	(19)
Orthids, 5 to 20 percent slopes	Very gravelly sandy loams and gravelly loams.	32	(51)	13.6	76	(30)	189	(77)
Argids, 0 to 25 percent slopes	Very gravelly silt loams and very gravelly clay loams, desert pavement.	43	(69)	18.4	103	(42)	256	(104)
KOFA ROUTE								
Orthents, 5 to 90 percent slopes	Very gravelly and very cobbly loams. Rock outcroppings.	31	(50)	13.0	59	(24)	167	(68)
Fluvents and Psamments, 0 to 10 percent slopes	Gravelly sands, loams silty clays, and sandy loams.	106	(171)	44.5	203	(82)	573	(231)
Orthids, 0 to 5 percent slopes	Sandy loams and loams and gravelly loams.	10	(16)	4.0	18	(8)	51	(21)
Orthids, 5 to 20 percent slopes	Very gravelly sandy loams and gravelly loams.	8	(13)	3.5	16	(6)	45	(18)
Argids, 0 to 25 percent slopes	Very gravelly silt loams and very gravelly clay loams, desert pavement.	82	(131)	35.0	160	(65)	450	(182)

(1) Permanently occupied acres refer to land used for roads, tower and communication sites.

Source: BLM Team

These well-drained to excessively-drained, shallow, gravelly loams and rock outcropping soils occupy gently sloping to very steep dissected uplands. The largest areas of badlands (Orthents) soils in the Brenda corridor occur at Indio Hills (mileposts 223-225) and Mecca Hills (mileposts 192-201). Badland soils in the Kofa corridor occur at Mecca Hills (mileposts 192-201). See map 1-1 for detailed locations of mileposts.

The largest areas of rockland (Orthents) soils in the Brenda corridor occur at Chuckwalla Mountains (mileposts 163-165) and Orocopia Mountains (mileposts 172-178).

Rockland (Orthents) soils in the Kofa corridor are found primarily in the Orocopia Mountains (mileposts 171-176). Mountain (Orthents) soils in the Brenda corridor occur primarily in the Dome Rock and Plomosa Mountains (mileposts 70-78, 92-96), and in the Kofa corridor primarily at mileposts 63-73, 88-97.

Approximately 50 percent of the Brenda and 45 percent of the Kofa corridor between the plant site and Devers are Fluvents and Psamments soils, see table 2-4. They are dominantly deep, well-drained to excessively-drained sandy soils occurring on level to moderately steep alluvial fans, terraces and flood plains. These soils occur in the Brenda corridor, primarily between mileposts 2-6, 14-25, 41-46, 50-52, 88-89, 101-120, 123-143, 176-190, 210-220, 225-235; and in the Kofa corridor, primarily between mileposts 3-37, 52-54, 85-87, 123-125, 128-133, 152-172, 175-193, 206-214, 219-237.

The Orthids soils, 0 to 5 percent slopes, comprise 3.4 percent of the Brenda and 4 percent of the Kofa corridor, see table 2-4. They are dominantly deep, well-drained, sandy loams, and loamy soils occurring on alluvial fans and flood plains. In the Brenda corridor, these soils occur primarily at mileposts 47-50, 52-55, and in the Kofa corridor at mileposts 39-43.

The Argids soils, 0 to 25 percent slopes, comprise 18.4 percent of the Brenda corridor and 3.5 percent of the Kofa corridor, see table 2-4. These are dominantly deep, well-drained, very gravelly silt loams, and gravelly clay loam soils on high to intermediate alluvial fans and terraces. They are characterized by a desert pavement surface. In the Brenda corridor, they occur primarily between mileposts 56-59, 78-87, 120-125, 144-154, and in the Kofa corridor between mileposts 54-63, 73-85, 96-101, 118-122, and 140-151.

VEGETATION

INTRODUCTION

Vegetation along the proposed and alternate transmission line routes has been classified into 14 habitat types, nine types in Arizona and five types in California. Habitat typing (Daubenmire, 1968 and U.S. Department of Agriculture (USDA), is an ecosystem approach to classification which uses both the vegetation and the site (i.e., soil, landforms).

MAJOR HABITAT TYPES

Figure 2-1 is an idealized profile relating vegetation and general soil conditions to various landforms in southwestern Arizona. The most characteristic landform feature in this part of Arizona and the desert in southeastern California is the gently sloping alluvial apron (bajada) of erosional material skirting the mountains.

In Arizona, the broad, nearly level, intermountain plains of the lower bajada are dominated by uniform stands of creosote bush and bursage (Lowe, 1964). Shallow drainages, occupied by scattered blue palo verde and ironwood trees, provide diversity at the upper elevations of this habitat. At lower elevations, the mesquite wash habitat characterizes the principal intermountain drainages of the Harquahala, Ranegras and La Posa Plains.

Positioned above the creosote flats, the transition zone consists primarily of desert pavement dominated by creosote bush and cholla. Dissecting the desert pavement are well developed drainageways occupied by palo verde, ironwood and saguaro. The upper bajada and lower mountain slopes are dominated by the Palo Verde-Saguaro habitat type which corresponds to the Arizona Upland (Lowe and Brown, 1973). Steeper and higher mountain slopes are occupied by the Saguaro-Agave habitat type.

Figure 2-2 is an idealized profile of the major habitat types and the associated plants, soil conditions and landforms in California. Creosote bush scrub habitat dominates the broad lower bajada plains as well as upper bajada alluvial fans and hills. The dry wash and wash complex habitats draining the bajadas are occupied by palo verde and ironwood trees. Unique habitats include sand dunes with endemic and rare species, palm oases located in canyons and arroyos in the Indio Hills and the Chuckwalla Valley Dune Thicket.

Habitat types for Arizona and California are described in detail in table 2-5 and delineated on Vegetation Map 2-6.

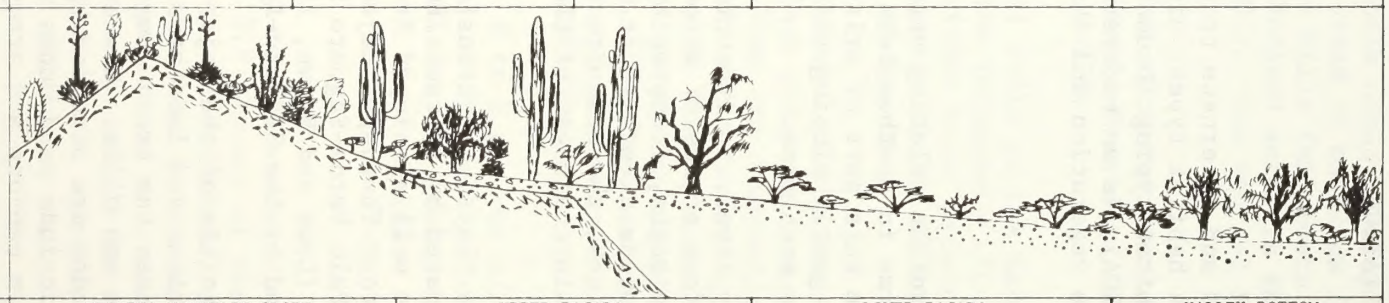
	AGAVE-SAGUARO	PALO VERDE SAGUARO	TRANSITION	CREOSOTE FLATS	MESQUITE WASH
HABITAT TYPES	Saguaro Agave Nolina Brittle Bush Teddy Bear Cholla	Saguaro Palo Verde Ocotillo Brittle Bush Teddy Bear Cholla	Saguaro Ironwood Palo Verde Creosote Chollas	Creosote Bush Bur Sage Chollas Hedgehog Crucifixion Thorn	Mesquite Desert Thorn Creosote
BASIN-AND-RANGE PROFILE					
	ERODING MOUNTAIN SLOPE	UPPER BAJADA	LOWER BAJADA	VALLEY BOTTOM	
LANDFORMS & SOIL CONDITIONS	Shallow, rocky or gravelly, soil with good drainage. No subsurface water.	Coarse-textured, rocky well-drained soil. Partly underlaid by rock outcrop. Desert pavement. No subsurface water. Dissected by drainageways.	Coarse and fine-textured soil, often with caliche hardpan. No subsurface water.	Fine-textured soil with poor permeability and low salt content. Subsurface water available periodically.	

Figure 2-1. Idealized profile showing the habitat types and soil conditions developed on the various land surfaces in southwestern Arizona. Modified from Benson and Darrow (1954).

Source: BLM Team

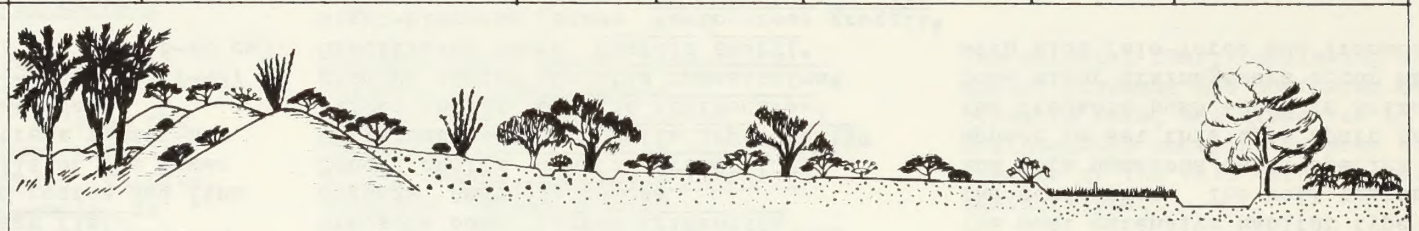
HABITAT TYPES	PALM OASIS	CREOSOTE BUSH SCRUB	DESERT DRY WASH	WASH COMPLEX	CREOSOTE BUSH SCRUB	AGRICULTURE	TAMARISK-MESQUITE RIPARIAN
	Fan Palm	Creosote Bush Brittle Bush Ocotillo	Palo Verde Ironwood Brittle Bush	Creosote Ironwood Bur Sage	Creosote Bur Sage Brittle Bush	Cotton Hay Crops	Tamarisk Mesquite Cottonwood Willow
HILL-AND-VALLEY PROFILE							
LANDFORMS & SOIL CONDITIONS	CANYONS AND ERODING HILLS	UPPER BAJADA	LOWER BAJADA		BOTTOM LAND	RIVER CHANNEL	BOTTOM LAND
	Gravelly and medium textured soils. Well drained. Seeps and springs in Palm Canyons.	Alluvial fans. Gravelly, cobbly medium textured soils. Well drained. Washes well developed.	Soil, sandy and gravelly. Well drained. Wash well developed.	Moderately coarse and medium textured soils. Well drained. Washes dissect a part of the bajada and form a wash complex. Development minor. Washes have shallow channels.	Medium and fine textured soil. Subsurface water available.		Medium and fine textured soil. High salt content. Subsurface water available.

Figure 2-2. Idealized profile showing the habitat types and soil conditions developed on the various land surfaces from Blythe to Devers Substation, California.

Source: BLM Team

TABLE 2-5

HABITAT TYPES IN ARIZONA

Habitat Types[1] Major Environmental Factors	Key Plants and Common Plants	Special Features
PLAINS (LOWER BAJADA)		
Creosote bush scrub Occupies the rocky alluvial fans from the Colorado River east to the Dome Rock Mountains. Extreme summer-hot region. Elev. 300'-800' (92-244 m) Ann. Precip. 3" (6.8 cm)	Creosote bush Larrea tridentata Bursage Ambrosia dumosa Brittle bush Encelia farinosa Silver cholla Opuntia echinocarpa* Ocotillo Fouquieria splendens*	Considered here as part of the creosote bush scrub of the Colorado Desert in California. Very sparse perennial vegetation. Annual species develop following summer storms.
Creosote-Bursage Flats Well drained coarse and fine textured soils of the lower bajada. Extreme summer-hot region, frost free. Elev. 1,040'-1,400' (317-427 m) Ann. Precip. 3.5"-8" (8-20 cm)	Creosote bush Larrea tridentata Bursage Ambrosia dumosa Pencil cholla Opuntia arbuscula* Christmas cactus Opuntia leptocaulis* Silver cholla Opuntia echinocarpa* Diamond cactus Opuntia ramosissima* Crucifixion thorn Castela emoryi* Night-blooming cereus Peniocereus greggii* Hedgehog cactus Echinocereus engelmannii* Barrel cactus Ferocactus acanthodes*	The most extensive habitat type in the study area. The soil texture and more numerous cacti species appear to set this type apart from the creosote bush scrub in Arizona. Some minor drainageways occur here with Blue Palo-Verde and Ironwood.
Mesquite Wash Occupies the medium to fine-textured soil with poor permeability and low salt content. Subsurface water is available periodically. Elev. 1,260'-1,360' (384-415 m) Ann. Precip. 3.5"-8" (8-20 cm)	Mesquite Prosopis glandulosa* Creosote bush Larrea tridentata Box-thorn Lycium sp. Galleta Hilaria jamesii	Year round good habitat for deer, Gambel's quail, jack rabbit and desert cottontail. With increasing agriculture and a falling water table, mesquite are dying and this habitat is declining.

TABLE 2-5 (Cont'd)

Habitat Types1 Major Environmental Factors	Key Plants and Common Plants	Special Features
Mesquite-Palo Verde Dry Wash Occurs in coarse textured, well-drained soil. Elev. 1,000'-1,100' (305-336 m) Ann. Precip. 3.5"-8" (8-20 cm)	Mesquite Prosopis glandulosa* Tamarisk, Salt-cedar Tamarix ramosissima Blue Palo-Verde Cercidium floridum* Creosote bush Larrea tridentata Desert Salt-bush Atriplex polycarpa	Dense growth of small trees and numerous shrubs provide extensive cover for small animals.
FOOTHILLS (UPPER BAJADA)		
Creosote and Palo Verde-Saguaro Transition On the upper bajadas the desert pavement with its coarse, gravelly textured, well-drained soils, is dissected by well developed small drainageways of finer textured soils. Extreme summer-hot region, frost free. Elev. 100'-1,350' (31-412 m) Ann. Precip. 3.5"-8" (8-20 cm)	Creosote bush Larrea tridentata Bursage Ambrosia dumosa Saguaro Carnegiea gigantea* Buckhorn cholla Opuntia acanthocarpa* Silver cholla Opuntia echinocarpa* Ironwood Olneya tesota* Blue Palo Verde Cercidium floridum* Foothill Palo Verde Cercidium microphyllum* Fishhook Mammillaria microcarpa*	The alluvial fans, consisting of desert pavement and dominated by creosote bush, are dissected by drainageways occupied by some tree species of the Palo Verde-Saguaro habitat type.
MOUNTAINS		
Palo Verde-Saguaro Occupies the upper bajada with its coarse-textured, rocky, well-drained soils and also lower eroding mountain slopes with shallow rocky or gravelly soil and good drainage. Frost free in winter, hot in summer. Elev. 1,200'-1,800+' (366-549 m) Ann. Precip. 5"-8" (12-20 cm)	Saguaro Carnegiea gigantea* Teddy bear cholla Opuntia bigelovii* Ocotillo Fouquieria splendens* Brittle bush Encelia farinosa Foothill Palo Verde Cercidium microphyllum* Barrel cactus Ferocactus acanthodes* Creosote Larrea tridentata Fishhook Mammillaria microcarpa*	Saguaro and other cacti reach their maximum density on this habitat type. This is part of Arizona's giant cactus desert, even though it lacks the luxuriousness of the desert near Tucson. Teddy bear cholla is an effective indicator of this habitat.

TABLE 2-5 (Cont'd)

Habitat Types[1] Major Environmental Factors	Key Plants and Common Plants	Special Features
Saguaro-Agave Occupies the steeper, higher, eroding mountain slopes. Soils are shallow, rocky or gravelly with good drainage. Elev. 1,800'-2,400' (549-723 m) Ann. Precip. 5"-8" (12-20 cm)	Saguaro Carnegiea gigantea* Century Plant Agavi desertii Nolina Nolina bigelovii Other common plants are the same as Palo Verde-Saguaro habitat.	The century plant and nolina occur here. The north-facing (moister) slope has a noticeably higher density and diversity than the south-facing (drier) slope. Nolina occurs only on some north-facing slopes.
Palo Verde-Saguaro Dry Wash Gravelly, coarse textured well-drained soil. Elev. 1,700' (519 m) Ann. Precip. 5"-8" (12-20 cm)	Foothill Palo Verde Cercidium microphyllum* Blue Palo Verde Cercidium floridum* Saguaro Carnegiea gigantea* Ironwood Olnea tesota Mesquite Prosopis glandulosa* Catclaw Acacia greggii Smoke Tree Dalea spinosa* Cheese-Bush Hymenoclea salsola	Broad wash with dense growth of trees and shrubs along the bank. Highly suitable deer and sheep habitat.
COLORADO RIVER VALLEY		
Tamarisk-Mesquite Riparian Occupies the sandy and moderately saline soils adjacent to the Colorado River. Subsurface water is available. Elev. 260' (79 m) Ann. Precip. 3" (6.8 cm)	Tamarisk, salt-cedar Tamarix ramosissima Mesquite Prosopis glandulosa* Arrowweed Pluchea sericea MacDougal cottonwood Populus macdougallii Willow Salix gooddingii	Scattered willow and cottonwood trees occur along the river bank. This is a favorable habitat for mammals and birds. Tamarisk dominates the habitat along with interspersed mesquite.

* State Protected plants in Arizona.

TABLE 2-5 (Cont'd)

HABITAT TYPES IN CALIFORNIA

Habitat Types[1]	Major Environmental Factors	Common Plants	Special Features
Creosote Bush Scrub	Usually found on well-drained soils of slopes, fans, and valleys, where winter temperatures are seldom below freezing. Elev. 0' - 2,000' (0-610 m) Ann. Precip. 5" (12.5 cm)	Creosote bush *Larrea tridentata* Bursage *Ambrosia dumosa* Brittle bush *Encelia farinosa*	Rich in annual plant species; the most common ecosystem in the California desert.
Desert Dry Wash	Soils tend to be loose and sandy. Runoff from adjacent mountain ranges causes periodic flooding. Drainage patterns are well developed. Elev. 400' - 800+' (122-244 m) Ann. Precip. 5" (12.5 cm)	Blue Palo Verde *Cercidium floridum* Cheese bush *Hymenoclea salsola* Ironwood *Olneya tesota*	High diversity of vegetation providing excellent wildlife habitat. Bird and reptile densities are often 10 to 50 times greater than adjacent creosote flats.
Wash Complex	Similar to above two ecosystems except channeling is not as pronounced. Elev. 440' - 1,400' (124-427 m) Ann. Precip. 5" (12.5 cm)	Creosote bush *Larrea tridentata* Ironwood *Olneya tesota* Bursage *Ambrosia dumosa*	Occurs where small arroyos flow into the lower valleys, creating an intergrade of vegetational types. These areas tend to be more diverse than the creosote flat areas.
Dunes	Loose, unstable, sandy soils. Elev. 0' - 400' (0-122 m) Ann. Precip. 5" (12.5 cm)	Creosote bush *Larrea tridentata* Wingscale *Atriplex canescens*	Unique biological areas in California. Because of the isolation of one dune system from another, each has evolved a number of endemic species, and many rare species.
Palm Oasis	Exists in isolated groves in moist alkaline, rocky canyons near seeps and springs on the south side of the Indio Hills. Elev. 400' - 600' (122-183 m) Ann. Precip. 5" (12.5 cm)	California Fan Palm *Washingtonia filifera*	Unique biological areas in California. Seeps and springs in canyons along earthquake faults provide water for groves of native palms in the Indio Hills.

1 Relates to map 2-6

Source: BLM Team

Major Habitat Type Evaluation: Habitat types discussed above are given a high, medium or low value based on the evaluation of the botanical resource according to five criteria in table 2-6. The habitats are listed from highest to lowest in their botanical value. Although five habitats are considered as high value, they occupy relatively short segments of the total route and represent the most significant impacts. This is a general evaluation and applies to the broad habitat types on map 2-6. Within these broad habitat types, unique habitat areas are singled out for special consideration in the following section.

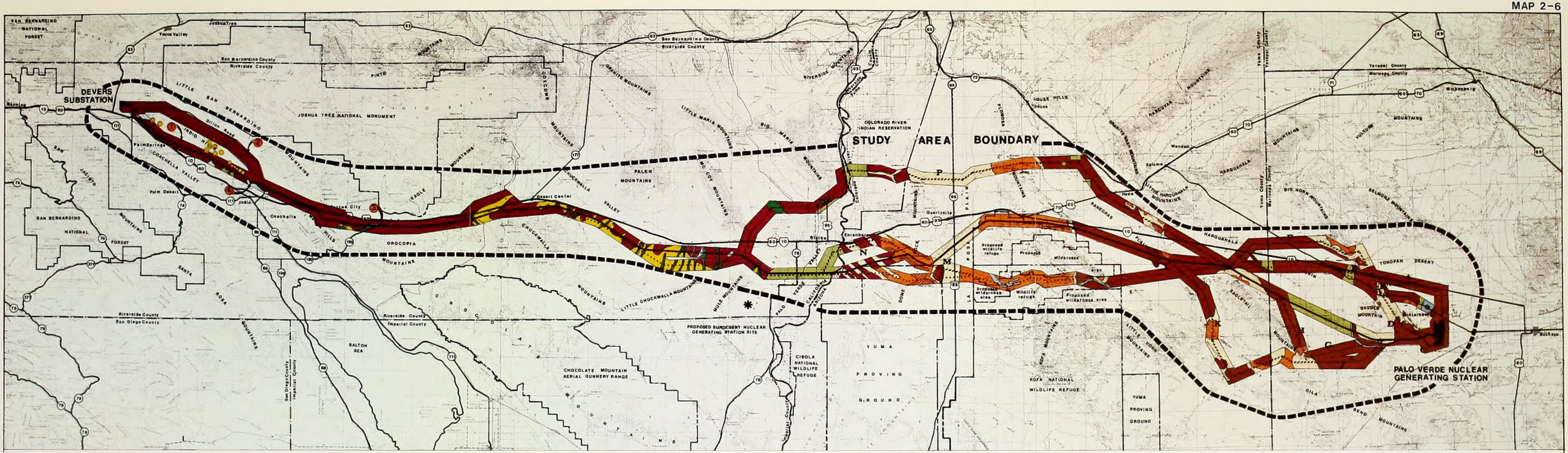
UNIQUE HABITAT AREAS

Unique habitats and the six criteria used for evaluation of the botanical resource (system developed by Riverside BLM office) are listed in table 2-7. These areas have been singled out for special consideration and are specifically located by milepost in the above table. The first category (Rarity of Habitat in California and Arizona) was considered highly important.

Endangered or threatened plant species habitat has been included in this section. If Federal endangered or threatened species were noted to be within 0.5 mile (.08 km) of the centerline, the habitat value was considered high as the main thrust of the Endangered Species Act of 1973 is the preservation of critical habitat. Although critical habitat has not been determined for these species, areas where these species occur on map 2-6 could potentially be designated as critical habitat by the FWS in a future evaluation of species environmental requirements as discussed in chapter 3.

STATE-PROTECTED AND SENSITIVE SPECIES

Arizona - The Arizona Native Plant Law (Arizona Revised Statutes, chapter 7, section 3-901) does not prevent the clearing of land for roads or other rights-of-way where protected native plants are not to be transported from the land or offered for sale. The law provides that the Arizona Commission of Agriculture and Horticulture be given at least 30-days notice prior to construction as amended in 1978 by the State Legislature (Senate Bill 1209). Notification will allow inspectors for the commission an opportunity to check the area and salvage State protected plants if necessary. Protected native plants encountered within the corridors studied are listed in table 2-5 and designated with an asterisk. These plants include the following genera within the cactus family: Opuntia, Mammillaria, Peniocereus, Carnegiea, Echinocereus, and Ferocactus. Other protected plants encountered are ocotillo, smoke tree, crucifixion thorn, mesquite, little leaf and blue palo verde, and ironwood.



LEGEND

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

HABITAT TYPES IN CALIFORNIA

VALLEY (LOWER BAJADA)

- CREOSOTE BUSH SCRUB
- DESERT DRY WASH WOODLAND
- WASH COMPLEX
- DUNES
- AGRICULTURE-URBAN

FOOTHILLS

- PALM OASIS

HABITAT TYPES IN ARIZONA

PLAINS (LOWER BAJADA)

- CREOSOTE BUSH SCRUB
- CREOSOTE-BURSAGE FLATS
- MESQUITE WASH
- MESQUITE-PALO VERDE DRY WASH
- AGRICULTURE
- TAMARISK-MESQUITE RIPARIAN

FOOTHILLS (UPPER BAJADA)

- CREOSOTE & PALO VERDE-SAGUARO TRANSITION

MOUNTAINS

- PALO VERDE-SAGUARO
- SAGUARO-AGAVE
- PALO VERDE-SAGUARO DRY WASH

THREATENED AND RARE SPECIES

STATE RARE (SR)

FEDERAL THREATENED (FT)

1. MECCA ASTER MACHAERANTHERA COGNATA SR, FT
2. FOXTAIL CACTUS CORYPHANTHA VIVIPARA SR, FT
3. DESERT BUCKWHEAT ERIGONUM DESERTICOLA SR, FT
4. DESERT RATTLEPOD ASTRAGALUS CROTALARIAE SR,

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

VEGETATION

SOURCE: BLM TEAM

TABLE 2-6

MAJOR HABITAT TYPE EVALUATION

Habitat Type[2]	Habitat Value	Evaluation Criteria[1]				
		Rarity of Habitat	High Species Diversity	High Density	Value for Watershed Wildlife	Natural Condition
Palm Oases	High	X		X	X	X
Sand Dunes	High	X			X	
Desert Dry Wash	High		X	X	X	
Palo Verde-Saguaro	High		X	X	X	
Saguaro-Agave	High		X		X	X
Tamarisk Riparian	Medium			X	X	
Mesquite Wash	Medium			X	X	
Transition	Medium				X	
Wash Complex	Low				X	
Creosote-Bursage Flats	Low					
Creosote Bush Scrub	Low					
Agriculture	Low					

1 An X indicates the criteria were considered important.
2 Habitat types correspond to map 2-6.

Source: BLM Team

TABLE 2-7

UNIQUE HABITAT EVALUATION

Unique Habitats	Milepost[b]	Habitat Value	Evaluation Criteria[a]					
			Rarity of Habitat	High Species Diversity	High Density	Value for Watershed, Wildlife, Etc.	Natural Condition	Protected[c] Species Present
BRENDA ROUTE								
Mesquite Wash	49.5- 51.0	Medium			X	X	X	
Palo Verde-Saguaro	65 - 80	High		X		X	X	
Palo Verde-Saguaro	94 - 96	High		X	X	X	X	
Tamarisk-Riparian	104.6-105.2	Medium			X	X		
Chuckwalla Thicket	128.6	High	X		X	X	X	
Dry Wash	185 -185.6	High			X	X		S[3]&F[3]
Palm Oases	209 -217	High	X		X	X	X	
Indio Hills	222	High						S[1]&F[1]
Sand Dunes	123, 128 205 -208, 215,230	High	X			X		S
	207.2	High	X			X		S[4]
KOFA ROUTE								
Mesquite Wash	33 - 33.5	Medium			X	X	X	
French Wash	75 - 77	High		X	X	X	X	
Saguaro-Agave	88 - 90.5	High		X		X	X	
Tamarisk-Riparian	102	Medium			X	X		
Sand Dunes	120,121.6	High	X			X		X
Dry Wash	183 -183.6	High			X			S[3]&F[3]
Creosote Bush Scrub	213	High						S[2]&F[2]

[a] An X indicates that the criteria was considered an important factor.
[b] See maps 1-1 and 2-6.
[c] State (S) and/or Federal (F) protected species are present. Numbers refer to Federal threatened species and State rare species as shown in chapter 2.

Source: BLM Team

California - Powell (1974) has edited the text "Inventory of Rare and Endangered Vascular Plants of California" prepared by the California Native Plant Society in cooperation with the State Office of Planning and Research, Office of the Governor. Powell's information on these rare plants was gathered from professional botanists at California universities, botanical gardens, and other agencies, as well as from knowledgeable native plant enthusiasts. The following rare and endangered plants have been identified within the proposed transmission line corridor and are noted on map 2-6 by the following numbers.

1. Mecca Aster, Machaeranthera cognata. This shrub was discovered in the Indio Hills (Brenda Route), and is classified as rare (Powell, 1974). It occurs in gypsum clays, etc., in the creosote bush scrub habitat below 500 feet (152 m).

2. Foxtail Cactus, Coryphantha vivipara var. alversonii. This cactus was discovered at the base of the Little San Bernardino Mountains (Kofa Route). It occurs in the creosote bush scrub habitat on stony slopes between 2,000 (610 m) and 5,000 feet (1,525 m).

3. Desert Buckwheat, Eriogonum deserticola. This erect shrub was found south of Joshua Tree National Monument (Brenda and Kofa Routes). It occurs along sandy washes and on dunes in creosote bush scrub habitat.

4. Desert Rattlepod, Astragalus crotalariae. This annual or short-lived perennial plant was found near Indio (Brenda Route). It occurs on sandy flats and fans in creosote bush scrub habitat below 1,000 feet (305 m). The plant is rare and distribution limited (Powell, 1974).

Other plants considered rare and endangered (Powell, 1974) may exist in the proposed corridor. A literature search revealed that some of the broad physical and biologic habitat factors (i.e., soils, landforms, geographic areas, elevations and plant communities) of three rare species coincide with the area crossed by the corridors. The assemblage of these interacting physical and biotic factors discussed for each species, provide at least some minimal conditions necessary for potential habitat of an individual, or a population, of a rare plant species. The following three species were not encountered in the field survey; however, based strictly on distribution, one or more of these species may be discovered within the corridors. It is possible to confirm occurrence of annual species only by repeated visits to the site.

5. Glandular ditaxis, Ditaxis adenophora. This species is a perennial plant considered rare in California, but common outside of the State (Powell, 1974). According to Munz (1974), this species is a member of the creosote bush scrub plant community and occurs in the Coachella Valley on sandy flats below 500 feet (153 m). It may occur on sandy soils at the base of the Indio Mountains near Palm Springs.

6. Little San Bernardino Mountain linanthus, Linanthus maculatus. This minute annual species is listed as very rare and is seldom seen because of its scarcity (Powell, 1975). Its population seems stable and not endangered (Munz, 1974). It occurs in sandy places between 500- and 4,000-feet (152 and 1,220 m) elevation and is a member of creosote bush scrub and Joshua tree woodland plant communities.

7. Scaly-stemmed sand plants, Pholisma arenarium. This nonchlorophyll species of plant grows as a parasite on roots of goldenbush, Haplopappus sp.; cheese bush, Hymenoclea sp.; and bursage, Ambrosia sp., in sandy places below 5,000 feet (1,525 m) elevation. It is a member of the creosote bush scrub plant community (Munz, 1974). The California Native Plant Society (Powell, 1974) noted that this species is endangered in part, is rare outside of California, and limited to several declining populations.

FEDERAL-ENDANGERED OR THREATENED SPECIES (Proposed List)

The Endangered Species Act of 1973 requires that Federal agencies shall take necessary action to ensure that actions authorized, funded, or carried out by them do not jeopardize the existence of endangered and threatened species or result in the destruction or modification of the critical habitat of those species.

It is the BLM policy to conserve Federal and State listed rare, threatened, or endangered plants and to utilize its authority in serving the purposes of the Endangered Species Act of 1973 and similar State laws. The BLM, through its actions and/or decisions, will not jeopardize the existence of any threatened or endangered plant species on the proposed FWS list, nor will it adversely modify critical habitat as determined by FWS. Although these species have a proposed threatened status at present, a future review of the list will be made by the FWS to determine whether each species is, in fact, threatened. Consequently, a future rulemaking could change the status of these species.

No species were identified in the study area which were on the FWS proposed endangered list. The following three species, proposed as threatened by the FWS (Federal Register of July 1975 and June 1976), have been located within the corridors. The species are in California, as discussed in the State-Protected and Sensitive Species Section, and are presented on map 2-6 by the following numbers.

1. Mecca Aster, Machaeranthera cognata

2. Foxtail Cactus, Coryphantha vivipara var. alversonii

3. Desert Buckwheat, Eriogonum deserticola.

WILDLIFE

HABITAT TYPES AND RELATED WILDLIFE

The wildlife habitat of the study area is typical of most desert lands. A precarious balance exists between the environment and wildlife species. Desert fauna is much like the desert flora in adaptation to the scarcity of water. Most mammals survive by avoiding extreme heat during the summer. Some animals are restricted to a specific type of habitat while others range over a wide area. Plant habitat types described in the previous section are closely correlated with various animal habitats.

The study area can be divided into three broad habitat types. These are creosote flats, Colorado River riparian, and Arizona upland. Habitat types can be defined with a tedious list of plant species, but normally physical characteristics of terrain are used.

In the California part of the study area, the prominent terrain features are broad alluvial fans with numerous shallow, dry washes. The dominant plant species is creosote bush. Less abundant species are palo verde, catclaw and ironwood shrubs. Most common wildlife are the coyote, badger, kit fox, black-tailed jack rabbit, desert cottontail rabbit, kangaroo rat, long-tailed pocket mouse, desert pocket mouse, numerous lizards and birds. An extensive list of animal species most likely to occur within the study area may be obtained from Federal or State wildlife agencies. The preceding tables on vegetation give an intensive description of plant communities along the proposed route.

Wildlife habitat within the study area in Arizona is distinguished by more prominent terrain features, with a greater variety and distribution of plants, than in California. Three primary wildlife habitats have been identified. First is the broad alluvial fan configuration between mountain ranges. The second is the foothill and upper alluvial fan region. The third habitat is a limited area of high mountainous terrain. The second and third types form the Arizona uplands.

The broad alluvial fans support a wide variety of plants including creosote bush, various small cacti, palo verde, ironwood and mesquite bushes. Common animals are coyote, kit fox, badger, jack rabbit, kangaroo rat, pocket mouse, ground squirrel, lizards and birds.

The second habitat type in the upper alluvial fans and foothills is a transition zone to the Arizona uplands. Here creosote areas are interlaced with dense shrub areas of little leaf palo verde, saguaro

cacti, ocotillo and ironwood. Common wildlife species are mule deer, coyote, bobcat, grey fox, rabbit, pocket mice, woodrat, ground squirrel, birds and various small reptiles.

The Arizona upland habitat occurs in higher mountain ranges. Brittle bush, creosote bush, jumping cholla, barrel and saguaro cactus are typical, with scattered shrubs and cacti common to the lower areas. This is the prime habitat of bighorn sheep and mountain lion. Mule deer and other species from the lower transition zone are also found. Mountain lions range from the higher mountains down into the lower foothills of the transition zone. Red-tailed hawks are frequently observed hunting in the high valleys. Birds and reptiles are less numerous.

MAMMALS

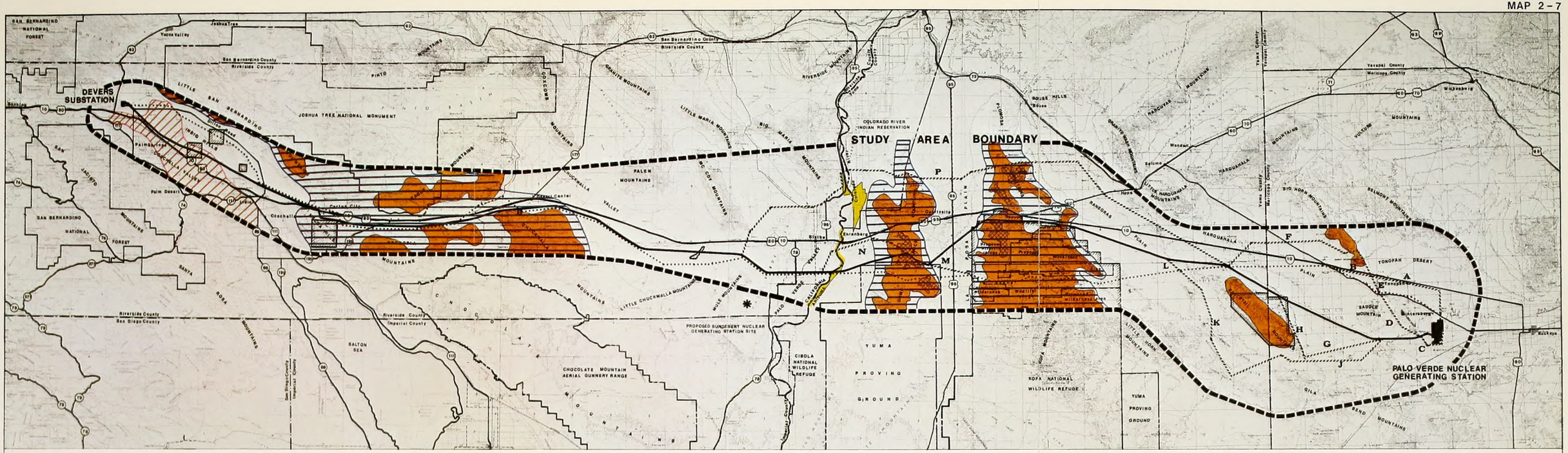
Desert bighorn sheep (Ovis canadensis) appear to be concentrated in highest mountain terrain where food plants are abundant. Some sheep are known to change ranges with the seasons while others stay in one locale year-round. Distribution and specific lambing areas are shown on the Distribution of Sensitive Wildlife and Unique Areas Map 2-7. The lambing activities of sheep usually occur from January through April. Good sheep habitat depends on an adequate year-round supply of drinking water. Watering points have been developed in most ranges where food is abundant. Most of these are simply rainwater collectors with holding tanks.

Mule deer (Odocoileus hemionus) are found throughout the study area at various seasons of the year. Primary habitat consists of shrub producing areas adjacent to higher mountains and large desert washes. Habitat is further defined by the density of plants such as palo verde, ironwood, mesquite and the giant saguaro cactus.

Wild burros (Equus asinus) are found throughout the study area. This species is descendant from animals that were abandoned or lost by early miners and ranchers. Burros now have acquired a competitive status with other wildlife (R. Weaver, 1972). Their primary habitat is in lower mountains and in the eroded hills adjacent to the Colorado River.

Mountain lions (Felis concolor) are a naturally low density species although potentially present in any mountain range where prey species, cover and protection can be found. The big cats are most often seen by big game hunters in mountainous and densely wooded areas.

Other predator species found throughout the study area include coyote (Canis latrans); kit fox (Vulpes macrotis); bobcat (Lynx rufus);



ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

- BIG HORN SHEEP LAMBING AREAS
- BIG HORN SHEEP RANGE
- MOUNTAIN LION RANGE
- COACHELLA VALLEY FRINGETOED LIZARD HABITAT
- COLORADO RIVER RIPARIAN
- UNIQUE, NATURAL, WILDERNESS, REFUGE AREAS

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

DISTRIBUTION OF SENSITIVE WILDLIFE AND UNIQUE AREAS

badger (Taxidea taxus); gray fox (Urocyon cinereoargenteus); ringtail cat (Bassariscus astutus). The coyote, fox and bobcat range over a wide area from upper mountains to lower plains in search of preferred prey species.

Rabbits are the most commonly seen species in the study area. The black-tailed jack rabbit (Lepus californicus) is present from lower plains to upper alluvial fans. The desert cottontail (Sylvilagus audubonii) can be found in all habitat types, but prefers rough terrain and mountains.

Many species of animals are closely associated with the Colorado River and adjacent lowland. This habitat supports beavers, muskrats, raccoons, skunks, salamanders, turtles and fish. A wide variety of water fowl, song birds and shore birds which depend on open water lives along this narrow belt of the study area. An extensive list of common species may be obtained at Arizona BLM offices.

Small mammals such as mice, shrews, rats, gophers, ground squirrels and bats are common throughout the study area. Extensive trapping data (Woodward-Clyde 1976) supports the known distribution of small mammals. These animals have adapted to dry desert conditions where all water needs are satisfied from food.

BIRDS

Many birds have been reported on or near the proposed routes although most are seasonal species. A significant number of bird species avoid the desert and use the Colorado River riparian area. Several unique species found only in the Southwest desert include elfowl, verden, cactus wren, Gila woodpecker, Phainopepla, Lucy's warbler, and curve-billed thrasher.

Raptors are the most readily observed birds in California and Arizona with the red-tailed hawk most common. Other species observed include kestrel, harrier, and Cooper's hawks. Seldom seen species include ospreys, prairie hawks, and peregrine falcons.

Game birds such as whitewing dove, mourning dove, and Gamble's quail are common in large desert washes and mountain valleys along the entire route.

Migrating waterfowl are commonly seen along the Colorado River. Ducks and geese feed in adjacent fields.

REPTILES AND AMPHIBIANS

A great variety of lizards and snakes inhabit dry desert lands in all habitat areas. Sixteen species of lizards (Woodward-Clyde, 1976)

were identified along the proposed routes, including the Gila monster found in Arizona, and the Coachella Valley fringe-toed lizard, found in California.

The desert tortoise has been observed throughout the study area, usually on friable soil areas where burrows are easily dug (Stebbins 1966).

Frogs, toads, and water turtles are found along the Colorado River and irrigation canals.

Snakes are well adapted to the desert environment. Nineteen species have been identified in the study area (Woodward-Clyde 1976).

ENDANGERED OR THREATENED SPECIES

The U.S. Department of the Interior (USDI) lists four species of endangered wildlife which might inhabit the study area, see table 2-8. The southern bald eagle is a known winter transient in the study area. The American peregrine falcon is rarely observed and may nest in this area although no nest sites have been discovered. The Yuma clapper rail is known to inhabit the riparian habitat along the Colorado River and may use the dry lakes when water is adequate. See map 2-7 for area locations.

Other species restricted to water habitat may also be present but will not likely be affected by the project.

The Arizona Game and Fish Department, January, 1976, Group II list (in danger of being eliminated from Arizona), indicates five species that may be expected to occur within the study area, see table 2-8. The mountain lion is likely in rough mountain areas. The black rail is known to occur along the Colorado River portion of the study area. The southern bald eagle, peregrine falcon, and the Yuma clapper rail are listed as endangered by the State and USDI.

Eight species are also listed under Group III (status in Arizona may be in jeopardy in the foreseeable future) by the Arizona Game and Fish Department. This list includes the desert bighorn sheep, desert tortoise, Gila monster, zone-tailed hawk, osprey, great egret, snowy egret, and the black-crowned night heron. These eight species are known to occur within the study area.

California lists three endangered species which may occur in the study area, see table 2-9. They are the southern bald eagle, peregrine falcon, and the Yuma clapper rail. California lists two additional species as "rare"; the California black rail, and California yellow-billed cuckoo. Five other species which occur in the study area are

TABLE 2-8

ENDANGERED AND THREATENED WILDLIFE SPECIES LIKELY TO OCCUR
IN THE ARIZONA PORTION OF THE STUDY AREA

Scientific Name	Common Name	USDI(1)		STATE OF ARIZONA(2)	
		Endangered	Threatened	Group II	Group III
Buteo albonotatus	Zone-tailed hawk				X
Pandion Haliaetus carolinensis	Osprey				X
Haliaeetus leucocephalus(3)	Bald eagle	X		X	
Falco peregrinus anatum	American peregrine falcon	X		X	
Rallus longirostris yumanensis	Yuma clapper rail	X		X	
Laterallus jamaicensis	Black rail			X	
Casmerodius albus egretta	Great egret				X
Egretta thula brewsteri	Snowy egret				X
Nycticorax nycticorax hoacthi	Black-crowned night heron				X
Felis concolor brownii	Yuma mountain lion			X	
Ovis canadensis mexicana	Desert bighorn sheep				X
Gopherus agassizi	Desert tortoise				X
Heloderma suspectum	Gila monster				X

Sources:
(1) USDI - Federal Register Vol. 42, No. 135, July 14, 1977.
(2) Arizona Game and Fish Department, January 1976.
(3) USDI - Federal Register Vol, 43, No. 31, February 14, 1978.

TABLE 2-9

ENDANGERED, THREATENED AND FULLY PROTECTED WILDLIFE
SPECIES LIKELY TO OCCUR IN THE CALIFORNIA PORTION OF THE STUDY AREA

		USDI(1)		STATE OF CALIFORNIA(2)			
Scientific Name	Common Name	Endangered	Threatened	Endangered	Rare	Fully Protected	
Aquila chrysaetus	Golden eagle					X	
Haliaeetus leucocephalus(3)	Bald eagle	X		X		X	
Falco peregrinus anatum	American peregrine falcon	X		X		X	
Falco mexicanus	Prairie falcon						
Laterallus jamaicensis coturniculus	California black rail				X	X	
Rallus longirostris yumanensis	Yuma clapper rail	X		X		X	
Coccyzus americanus occidentalis	California yellow-billed cuckoo				X		
Ovis canadensis nelsoni	Desert bighorn sheep					X	
Equus asinus	Wild burro					X	
Bassariscus astutus	Ring-tailed cat					X	
Gopherus agassizi	Desert tortoise					X	
Uma inornata	Coachella Valley fringe-toed lizard			(pending classification)			
Uma scoparia	Mohave fringe-toed lizard			(pending classification)			
Phrynosoma m'calli	Flat-tailed horned lizard			(pending classification)			

Sources:
(1) USDI - Federal Register, Vol. 42, No. 135, July 14, 1977.
(2) State of California, "At the Crossroads" 1976, 1977.
(3) USDI - Federal Register, Vol. 43, No. 31, February 14, 1978.

classified as protected. They are the desert bighorn sheep, golden eagle, wild burro, ring-tailed cat, and the desert tortoise. The status of the Coachella Valley fringe-toed lizard, Mohave fringe-toed lizard, and the flat-tailed horned lizard is presently pending classification.

UNIQUE HABITAT AND NATURAL AREAS

Two proposed natural areas, one proposed wildlife refuge, and two proposed wilderness areas are located in the Arizona segment of the study area. The locations of these areas are shown on map 2-7.

Unique habitats in the California portion of the study area consist of several fan palm oases, and sand dunes. Five proposed and one existing natural area are within the study area, see map 2-7.

LAND USE AND OWNERSHIP

The lands in the study area have ownership patterns varying from large blocks of land in private and Federal ownership to smaller interspersed parcels of Federal, State and privately-owned land. Land ownership is shown on map 2-8.

These lands are currently subject to a variety of uses. These uses include urbanization, livestock grazing, agriculture, wildlife habitat, outdoor recreation, mining, transportation and utility systems. Wildlife habitats and mining are discussed in Wildlife and Minerals sections. Controlling factors on land use are topography, climate, vegetation, water resources and soils. Land uses are shown on map 2-4.

AREAL LAND USES

Intensive areal land uses within the Arizona portion of the study area are concentrated in several isolated locations: Tonopah Desert; Harquahala Plain; upper Ranegras Plain; La Posa Plain (Quartzsite); and along the Colorado River.

In California, intensive land uses are centered in the Coachella Valley and are predominantly desert retirement communities such as Palm Springs, Desert Hot Springs and numerous smaller developments. Major exceptions to this include the Coachella/Indio and Blythe agriculture based urban area and Desert Center along I-10 at the junction with Highway 177.

Recreation Resources

Outdoor recreation within the study area is varied, somewhat seasonal, and largely related to non-water recreational activities.

The Recreation Resources Map 2-9, represents all medium to high value (Class A or B quality) recreation opportunities which were identified using the BLM's Recreation Information System (RIS). The RIS information is available in BLM's Yuma District Office. The RIS is an evaluation and rating process outlined in BLM Manual 6110. Information shown for the Blythe, California area west was adapted from the Sundesert ES prepared by the BLM, Riverside District Office. Campgrounds, specially designated sites and recreation areas are shown on map 2-4. Specific recreation activity information is available at the respective district offices involved.

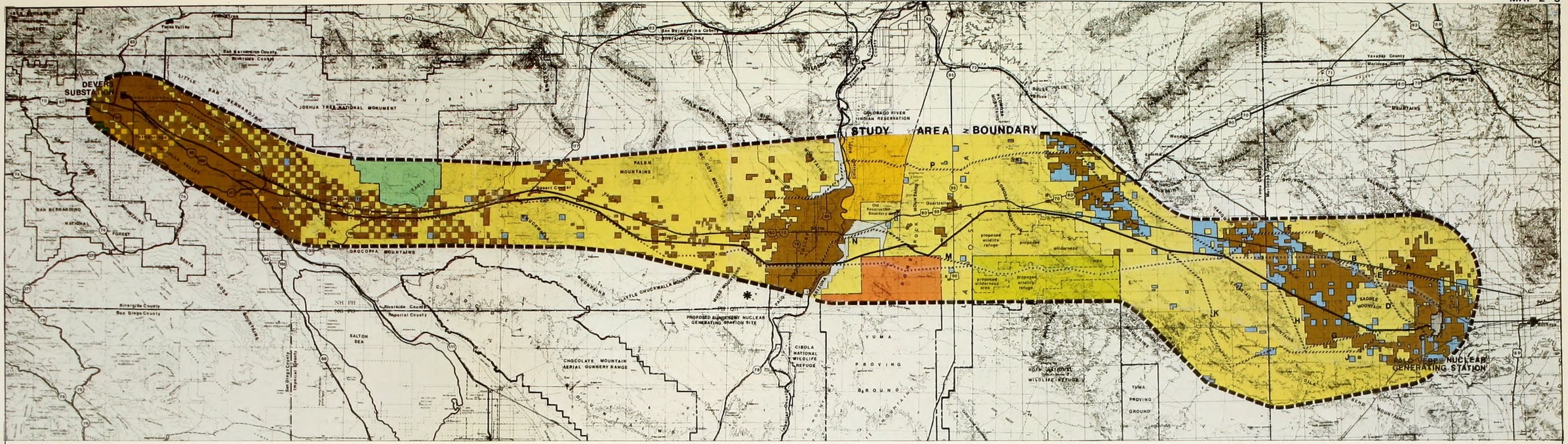
To facilitate analysis, opportunities have been grouped into the following related and general headings: Water-Related Activities; Non-Water Related Activities; Sightseeing; and Primitive Values.

A discussion of the four headings and their related activities within the study area follows.

Water-Related Activities (Fishing, Waterfowl Hunting, Swimming, Boating, and Skiing)

The only water related activities available to the recreationist in the study area are along the Lower Colorado River. This portion of the river is very popular for a variety of water sports, especially power boating and skiing. Although these activities take place throughout the year, the greatest concentrations of visitors can be found during four major holiday periods (Easter, July 4th, Memorial Day and Labor Day weekends). Most watersport activities take place from April through September. From October through March the most popular water-related activity is fishing. However, because of the channelized condition of the river in this area, fishing is not considered to be of high quality. This is also the season during which large numbers of retired people from northern states move into the area. While most visitors locate in desert areas, some prefer to set-up along the river. Most rent space at one of the several private, State, or county trailer parks which are located near Blythe, California. Relatively few choose to "rough-it" in unimproved areas along the river.

These visitors enjoy the climatic contrast with their area of origin as well as the opportunities for solitude, sightseeing and other outdoor recreation activities. The river is much more popular during



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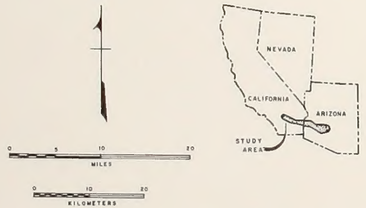


ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

- BUREAU OF LAND MANAGEMENT
- PRIVATE LANDS
- STATE LANDS
- BUREAU OF RECLAMATION WITHDRAWN LANDS
- INDIAN RESERVATIONS
- MILITARY RESERVATION
- NATIONAL FOREST
- NATIONAL MONUMENT
- KOFA NATIONAL WILDLIFE REFUGE

SOURCE: BLM TEAM & APPLICANT

UNITED STATES

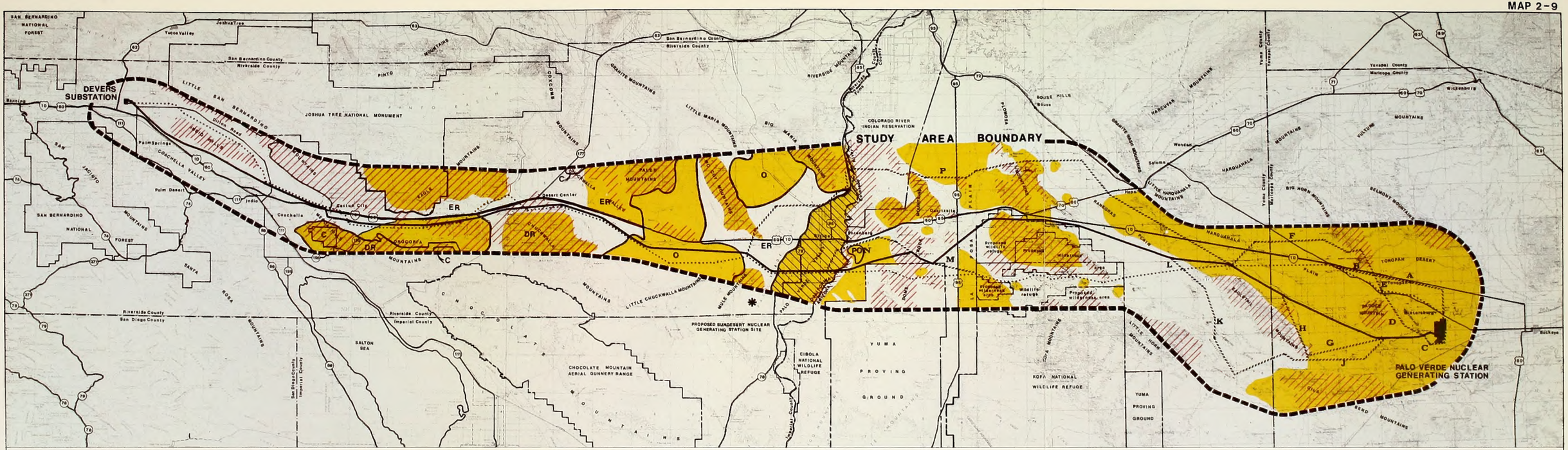
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

LAND OWNERSHIP



ROUTES UNDER STUDY

BRENDA

KOFA

SUBALTERNATES

A

LEGEND

- SIGHTSEEING: SCENERY, GEOLOGICAL, BOTANICAL, ARCHAEOLOGICAL, HISTORICAL, ZOOLOGICAL, OTHER CULTURAL
- WATER RELATED ACTIVITIES: FISHING, HUNTING, BOATING, SWIMMING, SKIING
- NON-WATER RELATED ACTIVITIES: HUNTING, COLLECTING, ORV
- ORV USE DESIGNATIONS
- O OPEN — PO PROPOSED OPEN
- C CLOSED
- DR DESIGNATED ROADS AND TRAILS ONLY
- ER EXISTING ROUTES ONLY

NOTE: CAMPGROUND AREAS ARE SHOWN ON THE LAND USE MAP

SOURCE: BLM TEAM & APPLICANT

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

RECREATION RESOURCES

weekends and holidays, especially during the warm season. At this time, large numbers of persons invade the river environs to participate in water sports, sunbathing, and other water and land associated activities.

Camping also occurs during these periods, but is generally concentrated in campgrounds and backwater areas. Visitor use is listed on table 2-10.

Waterfowl hunting is an important activity on the Colorado and some hunting takes place on agricultural lands around Blythe, California. Moderate duck populations may be found along the river and backwaters. Goose hunting takes place primarily within the Colorado River Indian Reservation and in the National Wildlife Refuges south of the study area.

Non-Water Related Activities (Hunting, Collecting and Off-Road Vehicles (ORV))

Arizona: Upland game bird hunting is a popular activity not only along the environs of the Colorado River, but also in the Harquahala Valley. Doves and quail are the primary species hunted. Big game hunting takes place in a majority of the mountain areas. Desert bighorn sheep is the most prized species hunted; however, the La Posa Plain, Big Maria Mountains and the Kofa National Wildlife Refuge do contain populations of deer which provide an important hunting opportunity.

Although off-road vehicle (ORV) activity is scattered throughout the area, two areas stand out. One is in the Upper Harquahala Valley where a motorcycle course has been set up. A smaller area just south of Ehrenberg, Arizona is a proposed ORV event and play area. These areas are shown on map 2-9.

Collecting is an activity which is very diversified in this desert region. Most collecting activities take place during the period from October through April. Collections include mineral specimens, petrified wood, and ironwood for carving. The season is capped by the Quartzsite Rock and Gem Show which may attract as many as 10,000 visitors. A third or more of these visitors stay in the Quartzsite area on public land during the period of the show. Table 2-11 lists estimated visitor use for Arizona.

California: As in Arizona, upland game bird hunting is popular along the environs of the Colorado River as well as in many large wash areas. Big game hunting is limited to deer since bighorn sheep are protected. Huntable populations of deer are sparse west of the river.

TABLE 2-10

ESTIMATED VISITOR USE

1976 Estimated Visitor Day-Use Along
The Colorado River Between Palo Verde Diversion
And The Imperial County Line[1]

(Based on a 12-Hour Visitor Day)

Federal Land

10,000 Visitor Days

State, County and Private Land

33,000 Visitor Days

Estimated Annual Visits To Riverside County Park Areas
Along The Colorado River[2]

	1975-1976	1976-1977
Collis Mayflower	29,925 Visits	11,945 Visits[3]
Peter McIntyre	29,552 Visits	95,512 Visits
Goose Flats	6,179 Visits	7,490 Est Visits
Ehler's Park	5,542 Visits	6,129 Est Visits

1 BLM Yuma District Office visitor use estimates.
2 Riverside County Parks, entrance station data.
3 Under construction for remodeling and expansion during 1976-1977.

Source: BLM Team

The interim California Desert Plan, available in Riverside District Office, identifies areas as open, restricted and closed to ORV use. These areas as well as areas used for other recreation activities are identified in the Sundesert Final ES. A summary of this data is also included on map 2-9.

Collecting activities are diversified, as in Arizona, and for the most part limited to late fall, winter and early spring months. The materials collected include: mineral specimens; petrified wood; and ironwood for carving. A small rock and gem show is held each year in the Palo Verde, California, area. It hasn't reached the proportions of the Quartzsite Show.

Table 2-12 lists the recreation sites and major recreation areas in California.

Sightseeing Activities (Scenery, Geological, Botanical, Archaeological, Historical, Zoological, other cultural)

Arizona: Sightseeing opportunities are common within this portion of the study area. Highly scenic mountain areas include the Saddle, Eagletail, New Water, Kofa and Dome Rock Mountains. Less striking but important ranges include the Little Horn, Plomosa and Big Maria Mountains.

The north end of La Posa Plain is especially scenic during occasional periods when precipitation is sufficient to encourage the growth of a multitude of desert annuals such as the showy desert primrose.

A number of archaeological finds of sightseeing quality are located in the study areas, however, most of these sites are not protected and visitation is not encouraged. Among these are several intaglio sites. Two sites which are well known in the area are interpreted for the public. One site consisting of petroglyphs is just southwest of Quartzsite in Tyson Wash. It is moderately accessible. The other site, the Blythe Intaglios, is about 11 miles (17.69 km) north of Blythe, California, on U.S. 95. This site presently receives numerous visitors and is listed on the National Register of Historic Places. Several historic sites of note are located in the study area. They include the Old Tyson Well and Stage Stop, and the Hi Jolly Gravesite in Quartzsite, Arizona, La Paz Well, Fort La Paz or Camp Colorado and the historic town of Ehrenberg, Arizona.

Another less well known National Register site is the Ripley Intaglios. It is located south of Blythe, California.

TABLE 2-11

ESIMATED VISITOR DAYS ON ARIZONA DESERT AREAS[1]

La Posa Plain and Recreation Site[2]	188,200
Kofa National Wildlife Refuge Proposed Addition[3]	180,000
General Area Use Estimates:[4]	
Little Horn Planning Unit	125,000
Vulture Planning Unit	97,000
Plomosa Mountains-Ranegras Plain	57,000

[1] Visitor use data for the area west from Blythe, California is included in the Sundesert ES and not shown here.
[2] Visitor Days Use, based on a 12-hour visitor use day. Data from BLM records.
[3] Kofa Wilderness Study.
[4] BLM estimates.

Source: BLM Team

TABLE 2-12

ESTIMATED VISITOR USE ON CALIFORNIA DESERT AREAS AND SITES[1]

Area or Name	Annual Visits	Annual Visitor Days
Wiley Well	39,930	97,428
Corn Spring	2,974	7,987
Salt Creek	1,703	5,798
Mecca-Orocopia Hills	15,186	46,452

[1] Taken from Sundesert Draft ES 1977.
[2] Defined as the aggregate of 12 hours of recreational use.

Source: BLM Team

California: Sightseeing opportunities in this portion of the study area are not quite as numerous. Several highly scenic mountain areas include the Chuckwalla, Palen, Orocopia, Eagle and the noteworthy Little San Bernardino Mountains. Other less scenic ranges include the McCoy and Mule Mountains.

Archaeological sites are relatively common. None having significant recreation potential have been identified.

Hayfield, Palen and Ford Dry Lakes provide recreationists with excellent examples of pleistocene lake bottoms and modern day playas. There are no interpretive facilities presently existing at these sites.

Historic features include Camp Young at Cactus, California, Granite Mine and Desert Center at Desert Center, California, the Aztec Mine on the east side of the Chuckwalla Mountains, and the Roosevelt Mine and Cowboy Grave located in the Mule Mountain area.

The Joshua Tree National Monument is also of significant interest.

Primitive Values

Recreation Lands Acquisition Plans (RLAPs)

No RLAP's (composite planning) were identified as being written within the study area in Arizona or California.

Arizona: Only one area was identified using the Recreation Information System (RIS) as having high quality primitive values. This was the Kofa Mountains. These primitive values should not be confused with wilderness values which are defined by law and are treated in the Wilderness Section.

Four other areas ought to be considered; they are the Eagletail Mountains, the Little Horn Mountains, the southern Dome Rock Mountains and the Plomosa Mountains. All of these areas are rugged and can provide an enjoyable primitive experience.

California: Four areas were identified by the Final Sundesert ES as having primitive recreational values. These were the Palen, Chuckwalla, Eagle and the Little San Bernardino Mountains. Two other areas that would provide an enjoyable primitive experience are the McCoy and Big Maria Mountains.

Agriculture

Agricultural areas within the study area are located in the Harquahala Plain, Ranegras Plain, north of Ehrenberg along the Colorado

River, and in the Coachella and Palo Verde Valleys. These lands are shown on map 2-4. Agricultural production by type includes field crops (cotton, alfalfa, grains) in all the agricultural areas, deciduous tree fruits (apricots, plums) in the Harquahala Plain and Colorado River area, and citrus, deciduous and truck crops in the Coachella and Palo Verde Valleys.

According to the SCS, approximately 75 percent of the agricultural land within the study area in Arizona may be classified as prime and unique farmland.

In the Palo Verde Valley of California, SCS estimates 80 percent of the existing agricultural land can be classified as prime and unique farmland. (SCS correspondence on file in Yuma District Office.) There is no information available at this time on the amount of prime and unique farmland within the Coachella Valley.

Livestock Grazing

The lands in the study area in Arizona administered by BLM are predominantly undeveloped and are largely used by ranchers with BLM grazing permits and/or leases for livestock grazing. All the BLM land in the Arizona portion of the study area is divided into grazing allotments. The grazing capacity of these allotments varies from month-to-month and year-to-year depending on the amount of moisture received. Generally it takes approximately 25-35 acres (10-14 hectares) to produce one Animal Unit Month (AUM). An AUM is defined as the amount of forage required to support one cow and her calf, under 6-months of age, for 1 month.

Only one grazing lease is issued by BLM in the California portion of the study area. This grazing lease encompasses an area of approximately 6,550 acres (2,653 hectares) located in the Ford Dry Lake area. Grazing permit records indicate that the area is grazed approximately every third year from September through April.

Air Facilities

While there are a number of "public" airfields throughout the study area, two principle airfields receive the heaviest traffic. These are the Blythe Airport at Blythe, California, and the Palm Springs Municipal Airport at Palm Springs, California. There are also numerous private dirt airstrips. These are located in agricultural areas and are devoted to crop dusting and related farming operations. There are three air navigation facilities located in the study area, see map 2-4. Routes were selected to avoid these facilities.

Communication Sites

A telecommunication system composed of both existing and new facilities is proposed by SCE to increase reliability of the microwave systems intertie between SCE and APS and to provide telecommunication services for the transmission line. Facility descriptions for all sites, including anticipated improvements and disturbed areas, are presented in table 1-3.

LINEAL LAND USES

An analysis of existing lineal land uses is significant and is kept separate from areal uses simply because it provides a potential path or opportunity for other types of lineal use, such as the system for which this ES is written.

Major transportation routes in the study area include I-10, U.S. Highways 60, 70, 95, and 62. The State of California has designated Highway 62 as a scenic route. The State of Arizona does not have a State scenic highway designation. Interior roads of varying quality provide access within the study area. The Major Highways and Arterials Map 2-10 shows the basic transportation system.

The Atcheson, Topeka and Santa Fe, and Southern Pacific Railroads provide passenger and freight service to the study area. Railroad facilities are shown on the Utilities Map 2-11.

The transmission line facilities in the study area are owned and operated by the Imperial Irrigation District (IID), SCE, Metropolitan Water District (MWD), the U.S. Bureau of Reclamation (USBR), and APS. Transmission lines are shown on map 2-11.

Southern California Gas (SCG) has three major natural gas pipelines in California. These lines enter the study area from Banning Pass and approximate I-10 to their departure from California at the Colorado River near Blythe. One of these lines has been proposed for upgrading and conversion to crude oil service by the SOHIO Corporation beginning in 1978 (see SOHIO Final Environmental Impact Statement). These lines continue into Arizona where they are owned and operated by EPG. The lines are buried approximately 3-1/2-feet (1.1 meters) below the surface. Pipelines are shown on map 2-11.

Large quantities of water are distributed by canal and aqueduct systems throughout the study area. In Arizona, the Central Arizona Project (CAP) has currently proposed to bring water from the Colorado River near Parker Dam to the Phoenix area. In California, the Colorado River Aqueduct brings water from the Colorado River across the

study area through the Coachella Valley. A system of major canals serves the water needs of the Coachella Valley. The Coachella Canal traverses the study area along the west side of the Mecca Hills and the Chocolate Mountains to the Coachella Valley. In the Palo Verde Valley a canal transports water for irrigation purposes throughout the Blythe vicinity from the Palo Verde Diversion Dam. Canals and aqueducts are shown on map 2-11.

The Pacific Telephone Company operates a coaxial cable through the study area. In California, the line generally follows I-10. In Arizona, this line is operated by American Telephone and Telegraph and follows the alignment of Routes 60-70 to Salome and then follows the Salome Highway to Buckeye.

SECRETARY'S TRUST POSITION

Private tribal Indian lands held in trust by the United States are not subject to the usual procedures for right-of-way acquisition. Consent of the tribal governing bodies must be obtained by the Secretary of the Interior or his authorized representative prior to the granting of rights-of-way across such lands. In some cases, lengthy negotiations between tribes and the utility interests are required before consent is granted. In the past, some Indian tribes have declined to grant consent. Therefore, the transmission corridor information in this statement, insofar as Indian lands are concerned, is to be considered tentative until such time as rights of way agreements are consummated with Indian tribes.

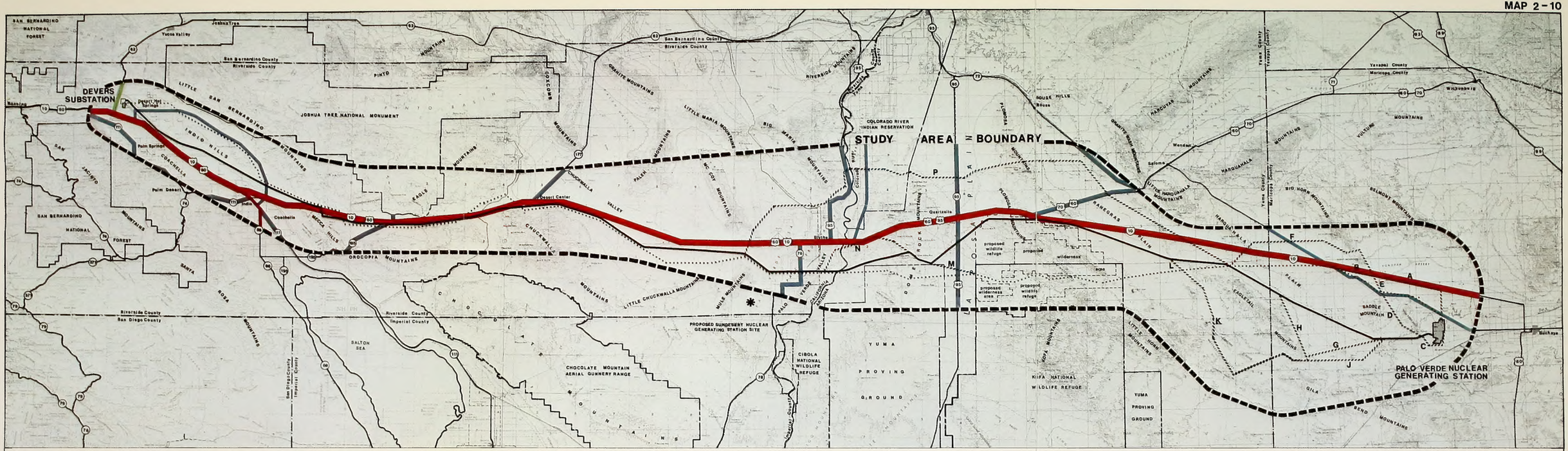
LAND USE PLANS AND CONSTRAINTS

Maricopa County, Arizona

The Maricopa County Planning Department is currently preparing a general plan for the entire county. A general plan exists for more urbanized areas, but it does not include rural areas. The Maricopa Association of Governments has prepared a composite Land Use Plan for Maricopa County, which was published in 1973 and includes the urban planning areas as well as the rural areas of the county. This study indicates continued agricultural uses in the McMullen Valley, Harquahala Plain, Tonopah Desert and the areas south of the PVNGS. The remaining areas of the county are designated for conservation.

Yuma County, Arizona

The County Planning Department is currently in the process of developing zoning, building and subdivision codes. The area within the study boundary is not currently zoned for specific uses. It is anti-



N

NEVADA
CALIFORNIA
ARIZONA
STUDY AREA

0 5 10 20
MILES
0 10 20
KILOMETERS

ROUTES UNDER STUDY
BRENDA
KOFA
SUBALTERNATES
A

LEGEND

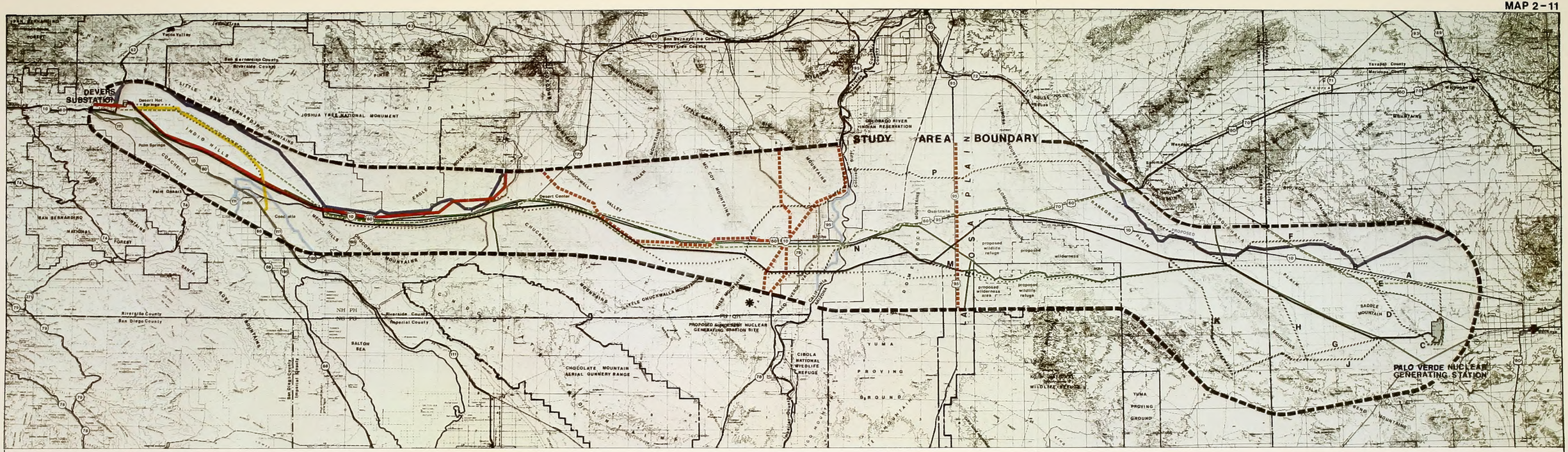
- INTERSTATE FREEWAY
- EXPRESSWAY
- SCENIC ROUTES
- STATE HIGHWAY
- OTHER ARTERIALS

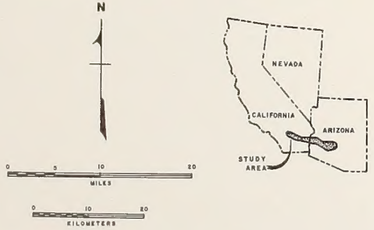
SOURCE: APPLICANT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

MAJOR HIGHWAYS
AND ARTERIALS





ROUTES UNDER STUDY

BRENDA

KOFA

SUBALTERNATES A

LEGEND

TRANSMISSION LINES

- 161 kV
- 220 kV
- 115 kV

OTHER UTILITY LINES

- PIPELINES
- MAJOR CANALS
- AQUEDUCTS
- TELEPHONE
- RAILROADS

SOURCE: APPLICANT

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

UTILITIES

cipated that when zoning occurs, most areas will be included in a rural residential category which permits 40-acre (16.2 ha) minimum lots. The areas in Yuma County, Arizona, where land use changes are expected to occur are in the immediate vicinity of Quartzsite. These changes would furnish additional commercial services to the numerous winter tourists.

Riverside County, California

Riverside County's General Plan indicates future land use of the Coachella Valley will be largely urban. Agricultural land use is projected along a waterway between the Salton Sea and the hills to the east with urban residential areas forecast within the agricultural region. The remainder of the county within the study area will remain as mountain, desert and conservation open space with the exception of the Palo Verde Valley and Blythe. Anticipated land use in this area includes expanded urban and agricultural use.

WILDERNESS

Section 201(a) of the Federal Land Policy and Management Act of 1976 requires that all public lands, their resources and other values be inventoried. Priority is to be given areas of critical environmental concern.

Section 603(a) of the Act of 1976 requires a review of those roadless areas of 5,000 acres (2,025 ha) or more and roadless islands of public lands, identified during the inventory required by Section 201(a) of the Act of 1976 as having wilderness characteristics as described in the Wilderness Act of September 3, 1964 (78 Stat 890). Each area or island, identified as to suitability or nonsuitability for preservation as wilderness, shall be reported to the President.

Wilderness character determination inventories were conducted within the Palo Verde-Devers study area by personnel from Arizona and California BLM offices. The description of the procedures, the data and analysis are available in Yuma, Arizona, and Riverside, California, District Offices for respective States.

On November 1, 1978, the Riverside District circulated a Draft Wilderness Inventory Phase document which identified Proposed Wilderness Study Areas (PWSAs) for the California Desert Conservation Area (CDCA). This completed the initial inventory phase of the wilderness inventories for the CDCA.

The Sundesert FES published in October 1978, contained the most up-to-date wilderness inventory data available in August 1978. The

situation as presented by the Sundesert Study changed significantly prior to the publishing of the Draft Wilderness Inventory Phase.

This document reflects the most up-to-date data as presented in the Draft Wilderness Inventory Phase and the Sundesert Statement.

The initial Wilderness Inventories are just beginning in Arizona, and the final determination of Wilderness Study Areas (WSAs) is not expected to be complete until September 30, 1980. California is working towards a determination date of February 28, 1979. Because the Wilderness Inventory is only in its initial phases, it is possible that the final decision on WSA boundaries may be different than those described for the Palo Verde-Devers Study Area in this document. As a result of the efforts to date, 11 areas have been identified. These areas are shown on map 2-12 and are described as follows:

ARIZONA

The portion of the Bighorn Mountains within the Palo Verde-Devers Study boundary would qualify in itself as a PWSA. However, it is a small part of a much larger area which may also qualify and is outside the scope of this study. The entire area will be considered in the State-wide wilderness studies which will start in the near future. Impacts of the proposed subalternate routes on this area will be discussed in chapter 8.

Area 1: Saddle Mountain

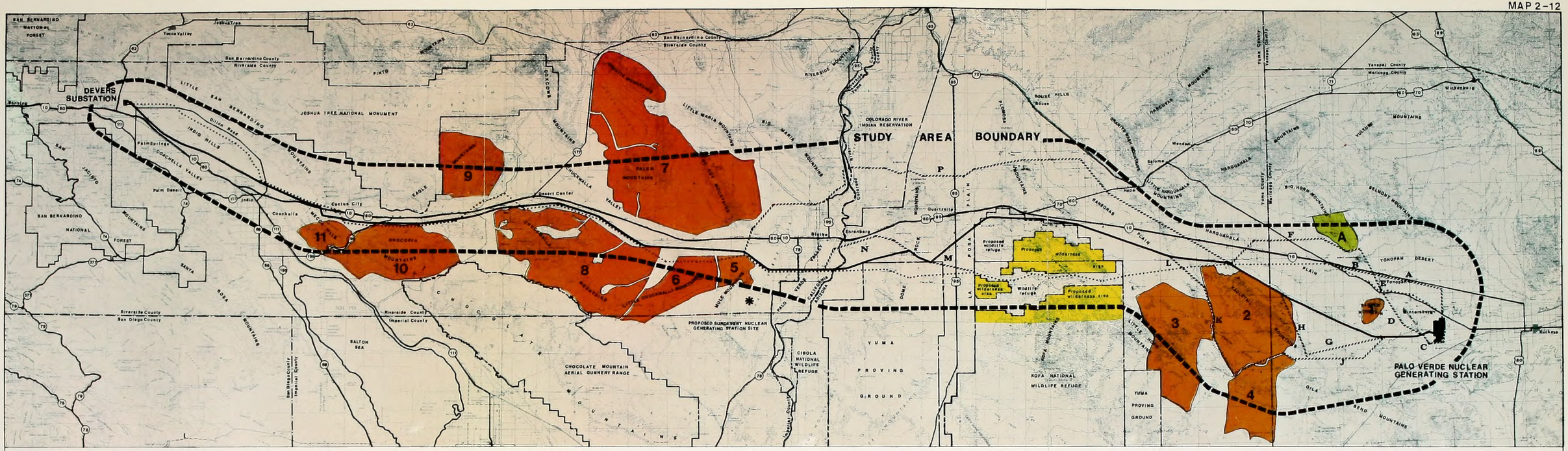
This PWSA is located about 10 miles (16.09 km) west of the PVNGS. It includes the area within the dirt road surrounding Saddle Mountain.

Area 2: Eagletail Mountains-Cemetery Ridge

This PWSA lies along the Gila and Salt River base line. It includes the Eagletail Mountains, Cemetery Ridge and the intervening land.

Area 3: Little Horn Mountains

The Little Horn Mountain PWSA includes: the northeast part of the Little Horn Mountains, a portion of Nottbusch Valley, and the southern tip of the Ranegras Plain. It lies along the Gila and Salt River base line.



LEGEND

- 1 PROPOSED WILDERNESS STUDY AREA WITH NARRATIVE REFERENCE NUMBER
- A AREA QUALIFYING, BUT PART OF A LARGER AREA
  This area will be considered in the State-wide wilderness inventory
- KOFA WILDERNESS PROPOSAL (FWS)

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

SOURCE: BLM TEAM

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

PROPOSED WILDERNESS STUDY AREAS

Area 4: East Clanton Hills

This PWSA includes the east end of the Clanton Hills. It lies along the Yuma-Maricopa County line, and between the Arlington-Clanton Well Road and Turtleback Mountain.

CALIFORNIA

Area 5: Mule Mountains

This PWSA includes the north portion of the Mule Mountains and a portion of the Chuckwalla Valley north of the Mule Mountains.

Area 6: Little Chuckwalla Mountains

This PWSA includes most of the Little Chuckwalla Mountains and a portion of the Chuckwalla Valley north of the mountains.

Area 7: Palen-McCoy Mountains

The PWSA encompasses the Palen, McCoy and Granite Mountains and a portion of the northern Chuckwalla Valley.

Area 8: Chuckwalla Mountains

The PWSA covers the Chuckwalla Mountains and a portion of the Chuckwalla Valley north and east of the mountains.

Area 9: Eagle Mountains

This PWSA rests primarily in the Eagle Mountains adjacent to the Joshua Tree National Monument.

Area 10: Orocopia Mountains

This PWSA includes the Orocopia Mountains and a small portion of the valley floor to the north of the mountains.

Area 11: Mecca Hills

The PWSA includes the southeast portion of the Mecca Hills.

VISUAL RESOURCES

The visual resource is defined as the land, water, vegetation, animals, and other visible features of an area. To evaluate and quantify the visual resources of the ES area, visual management units with visual resource management (VRM) classes were developed using procedures in BLM Manual 6300, Visual Resource Management. Visual management units are contiguous areas of similar visual quality. A VRM class contains specific objectives for maintaining or enhancing the visual resource values. Each class describes a different degree of modification allowed in the basic elements of the landscape.

Visual management units and Visual Resource Management (VRM) classes are based on three factors: (1) the scenic quality rating, (2) a sensitivity evaluation, and (3) a visual zone map (the location of each viewing area from a use area such as road, river or observation point).

The scenic quality rating system evaluates scenic areas and compares them with the physiographic region. The rating results place the area in one of three categories, A, B, or C.

Visual sensitivity levels provide an index to the relative importance of the visual response to an area. They indicate the relationship between the visitor and the aesthetic quality of the landscape.

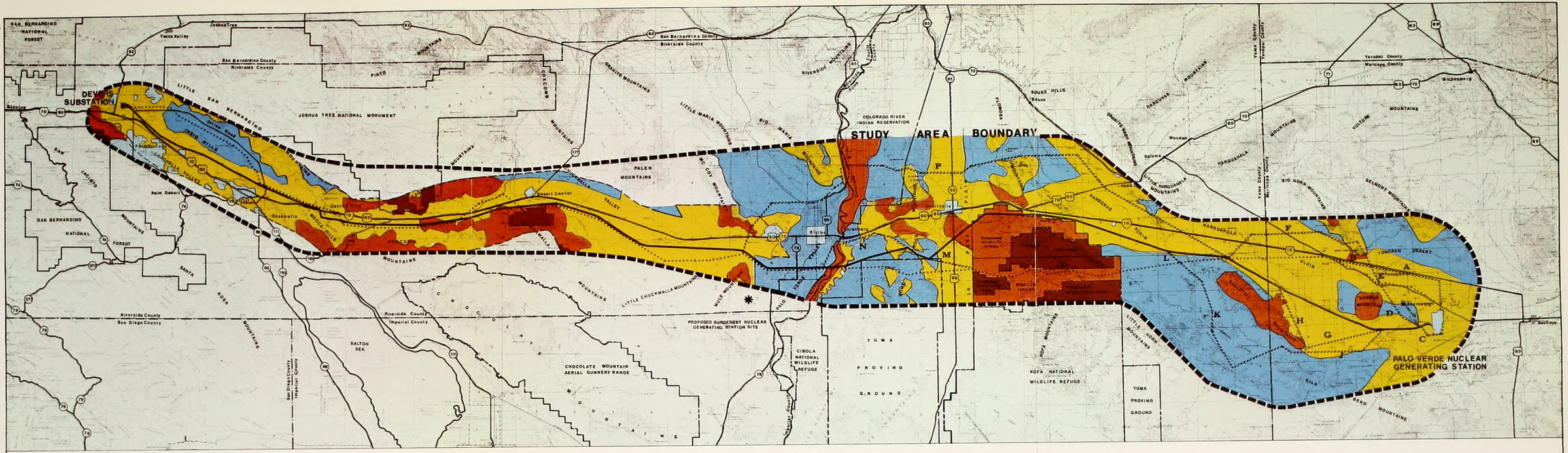
The Palo Verde-Devers ES area encompasses all of the five management classes. The Visual Resource Management classes are delineated on map 2-13.

Blythe Area East to PVNGS

Tentative VRM classes in this study area are identified and defined on map 2-13.

Class I: Only one area has been identified as having Class I characteristics. That is the area of the Kofa National Wildlife Area which the FWS has proposed to be designated as wilderness.

Class II: Several areas have been identified as having Class II characteristics. These include Saddle Mountain, Burnt Mountain and portions of the Big Horn Mountains, the Eagletail Mountains, the Kofa National Wildlife Refuge outside of the proposed wilderness area, a small portion of the Plomosa Mountains, portions of the Dome Rock Mountains and the La Posa Recreation Site located just south of Quartzsite,



N

0 5 10 20 MILES

0 10 20 KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

VISUAL RESOURCE MANAGEMENT CLASSES

- I — PROVIDES PRIMARILY FOR NATURAL ECOLOGICAL CHANGES
- II — CHANGES IN ANY OF THE BASIC ELEMENTS SHOULD NOT BE EVIDENT
- III — CHANGES IN THE BASIC ELEMENTS MAY BE EVIDENT, BUT SHOULD REMAIN SUBORDINATE
- IV — CHANGES MAY SUBORDINATE ORIGINAL COMPOSITION, BUT MUST REFLECT NATURAL OCCURRANCE

DEVELOPMENT AREAS

SUNDESERT STUDY BOUNDARY ----

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

VISUAL RESOURCE MANAGEMENT CLASSES

Arizona. A Recreation Management Plan for the development of the La Posa Site has been written and implemented. The site receives considerable recreational use during the winter months.

Areas north and south of Ehrenberg, Arizona, along the Colorado River are also identified as having Class II characteristics.

Class III: The area adjacent to the main travel areas along I-10 and U.S. 95 in Arizona have Class III characteristics. Although the scenery immediately adjacent to these routes is not considered to be of Class "A" or "B" quality by BLM RIS standards, the high volumes of daily traffic create a moderate visual sensitivity class. Other Class III areas can be found in most of the mountain areas, see map 2-13.

Class IV: Areas within Class IV are found throughout the study area, but are seldom seen by the general public.

Blythe Area West to Devers

Tentative VRM classes have been identified on map 2-13 for the various alternative routes west of Blythe (Final Sundesert ES).

Class I: Several areas have been identified as having Class I characteristics as follows: Portions of the Chuckwalla, Eagle, Cottonwood, Little San Bernardino, San Bernardino and the San Jacinto Mountains.

Class II: Areas having Class II characteristics would include portions of the Mecca Hills, Orocopia, McCoy, Little Chuckwalla and the Mule Mountains.

Class III: Most of the foreground areas adjacent to I-10 fall within Class III characteristics.

Class IV: Class IV areas are scattered throughout the study area: These include northern portions of the Chuckwalla Valley, backside of the Little San Bernardino Mountains and Indio Hills.

CULTURAL RESOURCES

Cultural resources within this context are defined as all evidence of past human activity as are manifested within the subject study area. This includes cultural manifestations generally studied in the disciplines of archaeology (both prehistoric and historic), history and ethnology. Natural resources are limited to the field of paleontology (i.e., fossil remains of plants and animals.

Cultural resource discussion in this chapter is limited to general information concerning (1) State and National Register Properties, and (2) known and probable levels of cultural resource density and sensitivity within the study area. In order to minimize vandalism or unauthorized collection or excavation of these nonrenewable resources, BLM policy (BLM Manual 9251-Preservation of Antiquities) discourages publicity of any archaeological site location or content information. Additional background information which may be necessary for professional review (reports, site maps, etc.) is on file at the Yuma BLM Office, and can be made available to qualified persons or agencies. A list of materials and background data on file is contained in the appendix.

STATE AND NATIONAL REGISTER PROPERTIES

Several cultural resources within the study area are either on the National Register, or are currently being reviewed for an eligibility determination, see table 2-13. Of the properties currently on the Register, one is within the 2-mile-wide (3.2 km) corridor. One property is within 1 mile (1.6 km) of the corridor, while the remainder lie within 3 and 10 miles (4.8 and 6 km) of the corridor. Several other properties are near the study area, but are not listed as it is unlikely the proposed project will have any effect on them. Detailed locations are available to qualified researchers at the BLM Yuma Office.

Potential National Register Properties

A number of properties within the study area have been either (1) declared worthy of an eligibility determination in a publication (e.g., BLM Unit Resource Analysis Reports, or other environmental studies), or (2) have been considered potentially eligible for the Register by an archaeologist, but currently lack sufficient field documentation for an eligibility determination. A major part of the Winter's Wash District is within the corridor, and all or a portion of several other areas are within 1 mile (1.6 km) of the corridors. Three site areas are within 3 miles (4.8 km) of the corridor, while three others are between 5 and 10 miles (8 and 16 km) from the corridors. A remaining single potential National Register property is beyond 10 miles (16 km) from the corridors.

TABLE 2-13

NATIONAL REGISTER AND STATE HISTORIC
LANDMARKS WITHIN THE STUDY AREA

	National Register Properties				State
		Eligibility Determination			
	On Register	In Process	Declared	Potentially Eligible	Historic Landmarks
Adjacent to or within centerline	None	None	None	1 Br 4 Lo 1 P	None
Inside 2-mile-wide corridor	None	1 Ko	1 Ko	5 Br 2 P 2 Ko	1 N
Within 1-mile of corridor	1 P	None	1 BrKo	None	1 BrKo
Within 3-miles of corridor	1 N	2 BrKo	2 BrKo	1 Ko	2 P 1 Ko
Within 10-miles of corridor	2 BrKo	1 Br, P	1 Ko 1 Br	1 BrKo	2 BrKo 3 Br
Remainder of Study Area	None	None	1 BrKo	None	None

Numbers indicate the number of properties per category. Due to extent, some larger sites or districts are listed in more than one category.

Br - Brenda Route
Ko - Kofa Route
BrKo - Brenda and Kofa Routes
N - Subalternate N
P - Subalternate P

Source: BLM Team

Further field work will be necessary to adequately document these properties for a Register eligibility determination. Clarification of their Register potential should be made when the final intensive centerline cultural resource inventory is completed.

State Historic Places Properties

In addition to National Register Properties, several properties within the study area are listed on the Arizona or California State Historical Places List, see tables 2-13 and 2-15. Of these one is within the corridors. One site area is within 1 mile (1.6 km) of the corridors, while three site areas are within 3 miles (4.8 km), and the remainder are within 10 miles (16 km) of the corridors.

CULTURAL RESOURCE DENSITY AND PROBABILITY

Cultural resource density is defined as the relative number of archaeological sites (all types) which are currently identified within various units or areas along the study corridors. Resource probability is defined as the relative number of probable sites which are expected in a particular unit or area when more complete inventory is made.

Table 2-14 lists the number of known and probable archaeological sites and the cultural resource inventory status along the two main alternate corridors per each 10-mile (16 km) unit. Table 2-15 lists known historic site areas for each corridor. Site density and probability data of table 2-14, and the historic data are summarized and detailed on map 2-14. Density and probability ratings as used on this map and table 2-14 are (1) very high (over 12 sites per 10-mile (16 km) unit), (2) high (8 to 12 sites per unit), (3) medium (4 to 7 sites per unit), (4) low (2 to 3 sites per unit), (5) very low (0 to 1 site per unit), and (6) uninventoried. All assigned density ratings are based on limited site data. Therefore, field inventory improvement may increase density ratings.

CULTURAL RESOURCE SENSITIVITY

The concept of cultural resource sensitivity attempts to integrate the significance of the resources present, in terms of density and type, with the likelihood of impact by the proposal. Table 2-16 and map 2-15 depict the currently assigned levels of sensitivity along the two corridors. Criteria and methodology for development of sensitivity levels of high, medium, low and unknown (insufficient data) are on file at the Yuma BLM Office.

TABLE 2-14

KNOWN AND PROBABLE ARCHAEOLOGICAL SITE DENSITY
PER 10-MILE UNITS
(From Palo Verde Plant Site and West)

A. Brenda Route

10-Mile Unit	Inventory Status	Known Sites 1-Mile-Wide Corridor	Known Sites 2-Mile-Wide Corridor	Current* Site Density	Probable Site Density
Plantsite to 10	400' wide Centerline inventoried	12	12	Very High	Same
10 - 20	"	10	10	High	High
20 - 30	"	1	1	Very Low	Same
30 - 40	"	5	5	Medium to High	Same
40 - 50	"	1	1	Very Low to Low	Same
50 - 60	"	4	4	Low to Medium	Medium
60 - 70	"	1	1	Very Low to Medium	Low
70 - 80	"	2	2	Low	Medium
80 - 90	"	7	8	Medium to High	High
90 -100	"	20	21	Very High	Same
100 -106	"	10	15	Very High	Same
106 -117	"	Colorado Riverbottom Farmland			
117 -120	"	4	13	Very High	Same
120 -130	"	0	1	Very Low	Same
130 -140	"	0	1	Very Low	Same
140 -150	"	0	1	Very Low	Same
150 -160	"	3	3	Low	Same
160 -170	"	0	1	Very Low	Same
170 -180	"	0	1	Very Low	Same
180 -190	"	0	1	Very Low	Same
190 -200	"	3	3	Low to Medium	Medium
200 -210	"	6	8	Medium to High	Same
210 -220	"	8	12	High to Very High	Same
220 -230	"	3	4	Low to Medium	Same
230 -Devers	"	0	0	Very Low	Same

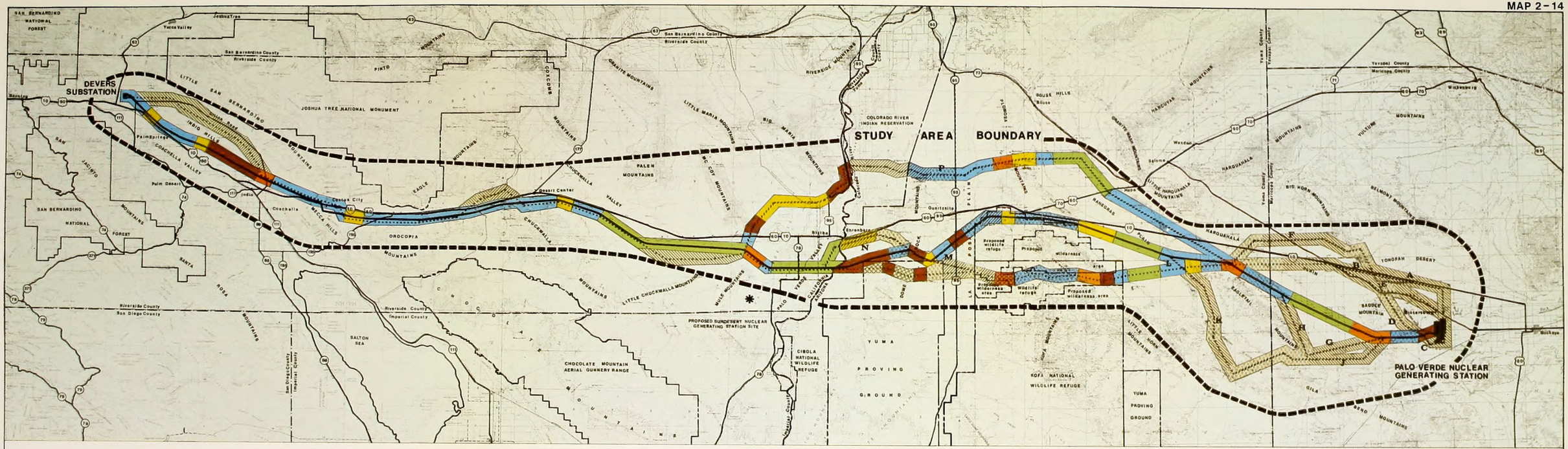
TABLE 2-14 (Cont'd)

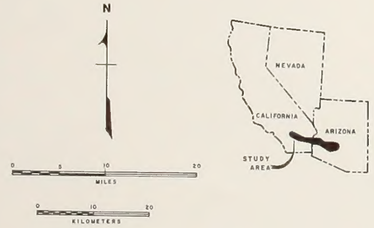
B. Kofa Route

10-Mile Unit	Inventory Status	Known Sites 1-Mile-Wide Corridor	Known Sites 2-Mile-Wide Corridor	Current* Site Density	Probable Site Density
Plantsite to SCE Point C (36.7 miles)	Uninventoried	0	0	Very Low	Very Low to High
Point C to 40	90' wide pipeline inventoried. (not in same position as line corridor)	3	3	Low	Medium
40 - 50	"	4	4	Low to Medium	Same
50 - 60	"	4	4	Very Low to Medium	Very Low to Very High
60 - 70	"	3	3	Low	Medium
70 - 80	"	7	7	Medium	High
80 - 90	Spot check Inventory	3	3	Low	Medium
90 -100	"	24	26	Very High	Same
100 -101	"	2	2	High	Same
101 -117.5	Same as Brenda Route				
117.5-120 (SCE Point F)	Uninventoried	0	0	Very Low	Same
120 -130	"	1	1	Very Low	Same
130 -135.5	"	0	0	Very Low	Same
135.5-157	Same as Brenda Route				
157 -160	Uninventoried	0	0	Very Low	Same
160 -170	"	1	1	Very Low to Medium	Same
170 -190	Same as Brenda Route				
190 -197.5	Uninventoried	1	1	Very Low	Low
197.5-207	Same as Brenda Route				
207 -Devers (30 miles)	Uninventoried	3	6	Low	Same

*(1) the inventory status of "uninventoried" is used for corridor segments which to date have not received some form of systematic cultural resource inventory. However, all corridor segments have received a limited field assessment by the BLM ES team archaeologist from which known and probable site density levels have been derived for these segments. (2) density per unit is not always a single level (i.e., low, etc.), but often is shown as (e.g.) low to medium; this reflects a condition where part of the unit is low while another part is medium, (3) the density levels depicted on map 2-14 are not 10-mile unit illustrations as in the above table, but reflect a more accurate on-the-ground situation.

Source: BLM Team





ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

KNOWN DENSITY

- VERY HIGH
- HIGH
- MEDIUM
- LOW
- VERY LOW
- UNINVENTORIED

PROBABLE DENSITY

- VERY HIGH
- HIGH
- MEDIUM
- LOW

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

CULTURAL RESOURCE DENSITY

TABLE 2-15

HISTORIC SITES OR AREAS FROM PALO VERDE
PLANTSITE TO DEVERS SUBSTATION

Known Site Area	2-Mile-Wide Corridor	Study Area, Close to Corridor
A. Brenda Route		
Plomosa/New Water Mountain Mining District	Numerous Mines	
Wick Mine	X	
Republic Mine		X
Ramsey Mine		X
Gold Nugget Mine		X
Bell of Arizona Mine		X
Jac A Lou Mine		X
Kuehn and Beamer Wells	X	
Copper Bottom Pass Mine and Area	X	
Several Military Emplacements	X	
Mule Mountain, Several Mines		X
Numerous Military Emplacements		X
Cowboy Grave	X	
Teague and Hopkins Wells	X	
San Pascual Well	X	
Granite Mine	X	
Patton's Training Camp		X
B. Kofa Route		
Winter's Well Site	X	
Palo Verde Mine	X	
New Water Well and Kofa Cabin	X	
Plomosa/New Water Mining District	Numerous Mines	
Renegade Mine		X
Livingston Mine		X
Indian Well Camp	X	
Twelve-Mile Well	X	
Cinnabar Mine		X
Copper Chief Mine	X	
Copper Giant Mine	X	

Source: BLM Team

TABLE 2-16

KNOWN AND PROBABLE CULTURAL RESOURCE SENSITIVITY LEVELS
PER 10-MILE UNITS (OR PORTIONS THEREOF)
(From Palo Verde Plant Site and West)

H = High M = Medium L = Low N = None ID = Insufficient Data

A. BRENDA ROUTE

10-Mile Unit	Portion of 10-Mile Unit	Known Sensitivity	Probable Sensitivity
0 - 10	0 - 2.5	Plantsite Area	
	2.5- 5	H	H
	5 - 7	L	L
	7 - 10	M	M
10 - 20	10 - 12	M	H
	12 - 16	M	H
	16 - 20	N	N
20 - 30	20 - 25	N	L
	25 - 30	N	L
30 - 40	30 - 32	M	M
	32 - 36	N	M
	36 - 40	M	M
40 - 50		N	L
50 - 60	50 - 53	N	L
	55 - 58.5	ID	M
	58.5- 60	ID	H
60 - 70	60 - 65	ID	H
	65 - 70	L	M
70 - 80		L	M
80 - 90	80 - 83	L	M
	83 - 86	M	H
	86 - 89	L	L
	89 - 90	M	M
90 -100	90 - 91	M	M
	91 - 93	H	H
	93 - 97.5	M	M
	97.5-100	H	H
100 -110	100 -107	H	H
	107 -110	N	N
110 -120	110 -116	N	N
	116 -120	H	H
120 -130		L	L
130 -140		N	L
140 -150		N	L

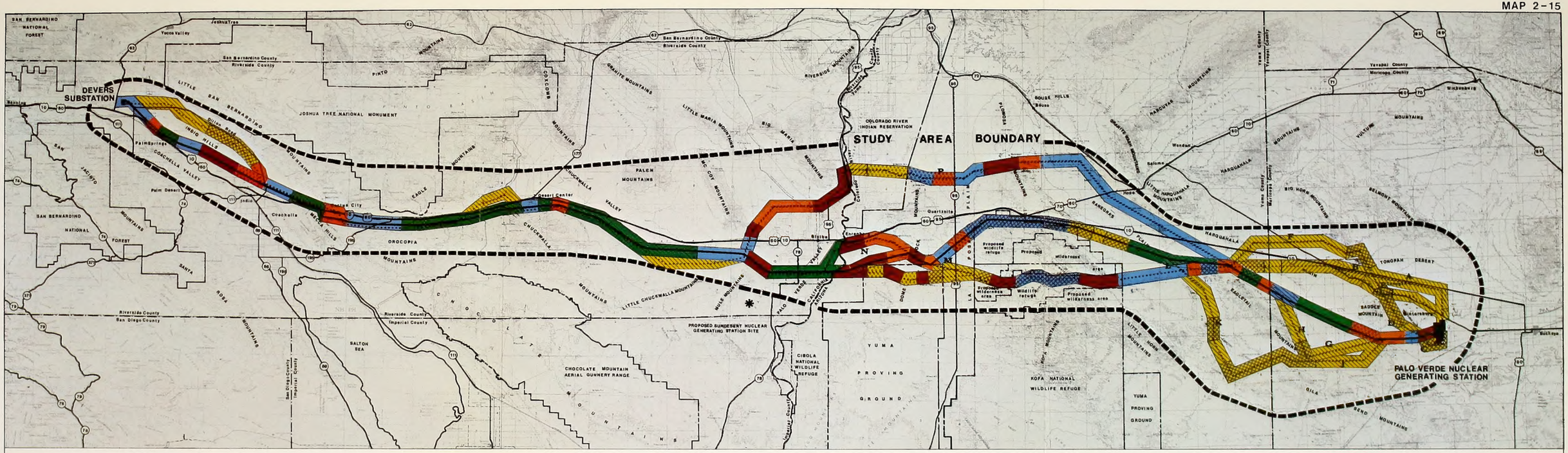
TABLE 2-16 (Cont'd)

10-Mile Unit	Portion of 10-Mile Unit	Known Sensitivity	Probable Sensitivity
150 -160	150 -153	L	L
	153 -156	M	M
	158 -160	N	L
160 -170		N	L
170 -180		N	L
180 -190		L	L
190 -200	190 -194	M	M
	194 -200	N	L
200 -210	200 -205	L	L
	205 -210	M	H
210 -220	210 -217	H	H
	217 -220	L	L
220 -230	220 -222	L	L
	222 -225.5	N	L
	225.5-230	M	M
230 -Devers		N	L
B. KOFA ROUTE			
0 - 10		ID	L
10 - 20	10 - 13	ID	M
	13 - 15	ID	L
	15 - 20	ID	N
20 - 30	20 - 25	ID	N
	25 - 30	ID	L
30 - 40	30 - 33	ID	L
	33 - 40	ID	M
40 - 50	40 - 41	M	M
	41 - 44	L	M
	44 - 46	M	M
	46 - 50	L	L
50 - 60	50 - 57	L	L
	57 - 60	H	H
60 - 70	60 - 62	H	H
	62 - 70	L	M
70 - 80	70 - 74	ID	M
	74 - 78	H	H
	78 - 80	ID	M
80 - 90	80 - 86	ID	L
	86 - 88	ID	M
	88 - 90	H	H

TABLE 2-16 (Cont'd)

10-Mile Unit	Portion of 10-Mile Unit	Known Sensitivity	Probable Sensitivity
90 -101	90 - 91.5	ID	H
	91.5- 94.5	H	H
	94.5- 98	ID	H
	98 -101	H	H
101 -117.5		Same as Brenda Route	
117.5-120		ID	L
120 -130		ID	L
130 -135.5		ID	L
135.5-157		Same as Brenda Route	
157 -160		ID	L
160 -170		ID	L
170 -190		Same as Brenda Route	
190 -197.5		ID	M
197.5-207		Same as Brenda Route	
207 -210		M	M
210 -220		ID	M
220 -230		ID	L
230 -Devers		ID	L
Devers Station		ID	L
Electronic Hill Communication Site		ID	L
Chuckwalla Communication Site		ID	L

Source: BLM Team



N

ROUTES UNDER STUDY

BRENDA

KOFA

SUBALTERNATES

A

LEGEND

- HIGH
- MEDIUM
- LOW
- NONE
- INSUFFICIENT DATA
- PROBABLE HIGH
- PROBABLE MEDIUM
- PROBABLE LOW
- PROBABLE NONE

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED PALO VERDE-DEVERS 500KV TRANSMISSION LINE

ARCHAEOLOGICAL SENSITIVITY

SOCIOECONOMIC CONDITIONS

The Palo Verde-Devers transmission line would pass through largely desert and mountainous areas of Maricopa and Yuma Counties, Arizona, and Riverside County, California. Few communities are located along either the Brenda or Kofa Routes and most of the cities, towns, and other settlements near the proposed corridors are small and diverse. Alternate routes cross or come within a few miles of three Indian reservations.

The Brenda Route would traverse 2 miles (3.2 km) of the Agua Caliente Indian Reservation near Thousand Palms, it passes within 2 miles (3.2 km) north of the Cabezon Indian Reservation, between Coachella and Indio, California, and passes approximately 4-1/2 miles (7.2 km) north of a part of the Torres Martinez Indian Reservation just outside Mecca, California. The Kofa alternative does not cross Agua Caliente lands, but passes within 5 miles (8 km) of a portion of these and of Cabezon Indian allotments.

At either end of the proposed corridor, numerous newly built or planned subdivisions reflect the proximity of such major metropolitan centers as Phoenix, Arizona, Anaheim-Santa Ana-Garden Grove, Los Angeles-Long Beach, and San Bernardino-Riverside-Ontario, in California. Phoenix, for example, lies 40 miles (64 km) east of PVNGS. Riverside is a comparable distance west of the Devers Substation. The transmission line routes approach these areas, but remain almost entirely outside the most populous portions of the three counties. The largest community near either alternative route is Palm Springs. Most socioeconomic characteristics of areas along either route are similar. Existing differences are noted below.

The first study area consists of residences and communities within a mile of either alternative alignment.

A second study area comprises communities within 5 miles (8 km) of the routes, 5 miles (8 km) being considered the approximate average limit of tower and cable visibility. Available data have been obtained for the U.S. Bureau of the Census county divisions (CCDs) and similar subcounty entities. Analysis of areas within 5 miles (8 km) of the proposed line proceeds on the basis of these geographic approximations.

The data analyzed below were obtained in two ways: (1) through knowledgeable individuals and responsible agencies, and (2) through more than 130 interviews with residents of areas within approximately 5 miles (8 km) of the two major alternative routes.

DEMOGRAPHIC FEATURES

In 1977, Maricopa and Yuma counties, Arizona, and Riverside County, California, referred to as the "three-county region," had an estimated population of 1,939,402 (Arizona Department of Economic Security, 1978; California Department of Finance, 1977). Of all inhabitants of the three-county region, 8.1 percent, or 150,200 lived in CCDs, all or parts of which were within 5 miles (8 km) of the two routes. Table 2-17 lists the number of inhabitants reported for each county and CCD in 1960, 1970, and 1976, and for each county gives the percentage of the total population represented by the CCDs.

The most populous communities located near the alternate routes are all in California. They are Coachella, Desert Hot Springs, Palm Desert/ Cathedral City, and Palm Springs CCDs in the Coachella Valley between the Salton Sea and the San Bernardino Mountains. In 1976, they contained an estimated 109,545 residents, equal to 72.7 percent of all inhabitants of CCDs adjoining the routes. With the addition of the populations of the Chuckwalla and Palo Verde (California) CCDs, the total number of residents of CCDs adjoining the California segment of the proposed line in 1976 was 126,225 or 83.8 percent of all inhabitants of CCDs along the routes.

The population of the three-county region, and of certain communities in the study area in particular, fluctuates seasonally because of winter vacationers and tourists visiting resorts and recreational attractions, especially in Riverside County, California. Estimates vary, but as many as 50,000 visitors may swell the population of the CCDs along the line by 33 percent. These seasonal inhabitants have left their mark on the communities they visit, as the reliance of many communities on tourist income and vacationer spending is almost total.

An uneven pattern of growth has resulted in population densities along the transmission line corridor differing greatly from county to county, and among CCDs as shown in figure 2-3. The Palm Springs, California CCD, coterminous with the community of Palm Springs, California, and the highest population density of any area along the route in 1976, had 670 persons per square mile (Riverside County Planning Department, 1977). The Chuckwalla CCD, also in Riverside County, California, had the lowest (one person per square mile or 0.149 percent of the density of Palm Springs, California). The average population density for the area through which the transmission line would pass was 12.7 persons per square mile, far below the national average of 55.

No Arizona community within 5 miles (8 km) of the proposed route has more than 1,000 inhabitants.

TABLE 2-17

NUMBER OF INHABITANTS, THREE-COUNTY REGION, 1960 - 1977

County/CCD	1960 Number of Inhabitants	1960 Percent of County Population	1970 Number of Inhabitants	1970 Percent of County Population	1976 Number of Inhabitants	1976 Percent of County Population
MARICOPA, ARIZONA	663,510	100.0	971,228*	100.0	1,300,000*	100.0
Buckeye CCD	8,334	1.3	7,807	0.8	7,920	0.6
County Subtotal	8,334	1.3	7,807	0.8	7,920	0.6
YUMA, ARIZONA	46,235	100.0	60,827	100.0	74,900*	100.0
Parker CCD	4,759	10.3	9,579	15.8	16,575	24.4
County Subtotal	4,759	10.3	9,579	15.8	16,575	24.4
RIVERSIDE, CALIFORNIA	306,191	100.0	459,074	100.0	547,600	100.0
Chuckwalla CCD	2,564	0.8	4,147	0.9	4,070	0.7
Coachella CCD	27,265	0.9	38,411	8.4	42,690	7.8
Desert Hot Springs CCD	3,037	1.0	5,927	1.3	5,845	1.1
Palm Desert/ Cathedral City CCD	10,218	3.3	21,725	4.7	32,300	5.9
Palm Springs CCD	13,468	4.4	20,936	4.6	28,710	5.2
Palo Verde CCD	12,523	4.1	12,250	2.7	12,610	2.3
County Subtotal	68,805	22.5	103,396	22.6	126,225	23.0
THREE-COUNTY REGION	1,015,936	100.0	1,491,129*	100.0	1,922,500*	100.0
TOTAL CCDs	81,898	8.1	120,782	8.1	510,720	8.1

Sources:

U.S. Department of Commerce, Bureau of the Census, 1970, Census of Population Volume I, Characteristics of the Population, Part 4, Arizona (Washington, D.C., February 1973) Part 6, California (Washington D.C., April, 1973).

Arizona Department of Economic Security, Population Estimates of Arizona as of July 1, 1976, Phoenix, Arizona, August 1977; California Department of Finance, California Statistical Abstract, Sacramento, California, June, 1977, and Harbridge House, Inc., 1977.

* 1977 Estimates, Arizona Department of Economic Security, Population Estimates of Arizona as of July 1, 1977, Phoenix, Arizona, June, 1978.

POPULATION DENSITIES THREE-COUNTY REGION, 1976

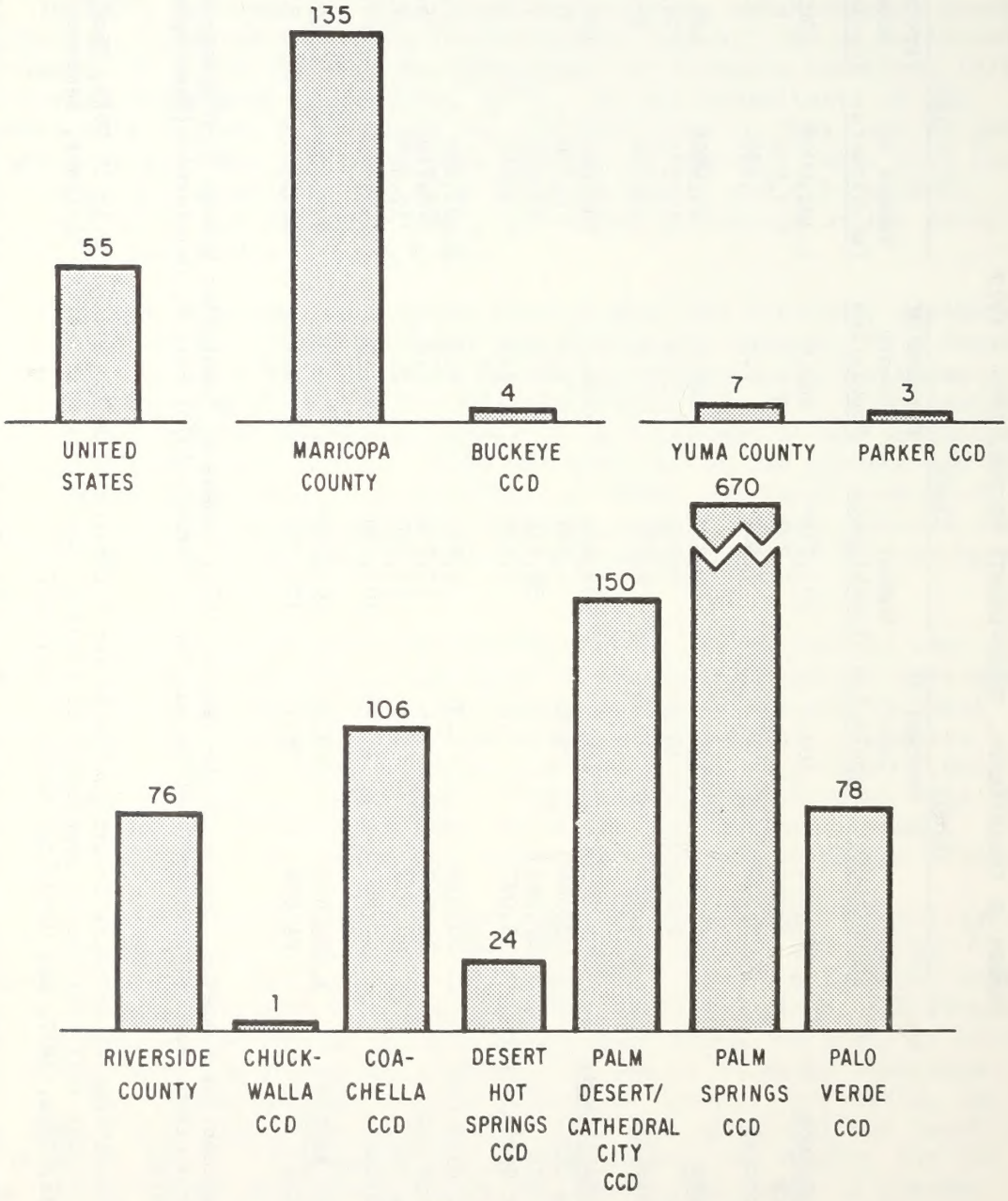


Figure 2-3

Source: Harbridge House, Inc.

ECONOMIC CHARACTERISTICS

In 1976, as shown in table 2-18, an estimated 652,850 workers were employed in the three-county region (Arizona Department of Economic Security, 1977; California Employment Department, 1977).

COMMUNITY INFRASTRUCTURE

Rural communities, such as those in Buckeye CCD rely on small clinics and general practitioners for basic health care, and inhabitants must drive long distances to obtain extended or special care. More populous areas, such as Palm Springs have a large general hospital and many smaller specialized clinics that cater to local inhabitants and visitors, and offer a range of sophisticated medical care. The extent of other services also varies. Police protection is more regular and fire protection more complete in the larger communities. Table 2-19 summarizes the condition of health care and public safety facilities.

Other aspects of community infrastructure in the three-county region reflect the character of regional economies. In the metropolitan areas at either end of the proposed transmission line, are highly developed transportation networks, in between are a few primary highways. These roads are designed and well maintained to handle increased traffic volumes. Secondary roads are not developed.

Vacationers and tourists create much of the traffic on primary highways and secondary roads in areas along the two routes. The popularity of recreational attractions in the three-county region has resulted in a proliferation of hotels, motels, trailer parks and other transient accommodations. Transient dwelling units constitute more than 33 percent of all housing in CCDs located in the study area. Table 2-20 profiles the accommodations for visitors in each county and CCD. In 1976, these areas had 10,742 hotel and motel rooms, and 12,048 sites in trailer parks, mobile home courts, and recreational vehicle campgrounds (Arizona Office of Economic Planning and Development, 1977; Riverside County, California, Department of Development, 1977).

SOCIAL AND CULTURAL CHARACTERISTICS

With few exceptions, areas immediately adjacent to the routes are rural.

Two distinct subcultures exist in the region: the Hispanic subculture, which is especially strong in the Coachella-Indio area, and the Indian subcultures found in and around several reservations.

TABLE 2-18

NUMBER EMPLOYED, IN CCDs, 1976

Sector	Maricopa County, Arizona 1976	Yuma County, Arizona 1976	Riverside County, California 1976
Agriculture	10,600	5,450	10,675
Mining	400	25	1,250
Construction	22,800	1,100	6,330
Manufacturing	73,000	1,250	26,050
Transportation, Communication, and Utilities	23,200	800	9,400
Wholesale and Retail Trade	115,200	5,675	41,250
Fire	32,900	600	6,150
Services	84,900	3,550	34,900
Government	85,000	5,500	44,850
TOTAL	448,000	23,950	180,900

Sources:

Valley National Bank of Arizona, Arizona Statistical Review (Phoenix, Arizona, September, 1976).

Information supplied by Southern California Association of Governments and the California Employment Development Department, 1977.

TABLE 2-19

HEALTH CARE AND PUBLIC SAFETY, IN CCD, 1976

County/CCD	Number of Doctors	Doctors/ 1,000 Population	Hospital Beds	Number of Police Officers	Police Officers/ 1,000 Population	Number of Fire-fighters Full-time	Number of Fire-fighters Volunteer	Fire Insurance Rating[c]
MARICOPA, ARIZONA								
Buckeye CCD	3	0.4	0	16	2.0	0	16	7-10
YUMA, ARIZONA								
Parker CCD	2	0.1	36	17	1.2	0	20	6-10
RIVERSIDE, CALIFORNIA								
Chuckwalla CCD	0	0.0	0	5	1.3	2	10	9-10
Coachella CCD	112	2.6	185	171[a]	4.0	40	22	5-9
Desert Hot Springs CCD	5	0.9	0	1	0.2	0	b	7-10
Palm Desert/ Cathedral City CCD	60	1.9	138	b	b	6	15	8-10
Palm Springs CCD	114	4.0	225	205	7.1	53	0	5
Palo Verde CCD	11	0.8	36	37	2.9	0	30	7-9
TOTAL, ALL CCDs	307	2.0	620	452	3.0	101	113	5-10

[a] Includes the 100-man staff of the Riverside, California, County Sheriff's Department in Indio.

[b] Relies on County Departments.

[c] On a scale of 1 (best) to 10 (worst).

Sources:
County profiles prepared by Arizona Office of Economic Development and Planning, and by Riverside County Department of Development; and Natelson Company, Sundesert Transmission System: Community Impact Analysis (Riverside, California, 1977).

TABLE 2-20

PERMANENT AND TRANSIENT ACCOMMODATIONS, IN CCDs, 1976

County/CCD	Number of Dwelling Units	Number of Hotel or Motel Units	Number of Trailer or Mobile Home Sites
MARICOPA, ARIZONA	405,770	-	-
Buckeye CCD	2,440	35	50
County Subtotal	2,440	35	50
YUMA, ARIZONA	21,630	-	-
Parker CCD	5,500	500	200
County Subtotal	5,500	500	200
RIVERSIDE, CALIFORNIA	202,500	-	-
Chuckwalla CCD	1,410	50	778
Coachella CCD	12,010	1,057	2,070
Desert Hot Springs CCD	4,300	1,128	2,851
Palm Desert/ Cathedral City CCD	17,920	532	3,934
Palm Springs CCD	17,050	6,700	2,811
Palo Verde CCD	4,040	740	354
County Subtotal	56,730	10,207	12,798
THREE-COUNTY REGION	629,900	-	-
TOTAL ALL CCDs	64,670	10,742	13,048

Sources:

Estimation based on U.S. Department of Commerce, Bureau of Census, Census of Housing: 1970, Volume I, Housing Characteristics for States, Cities, and Counties, Part 4, Arizona (Washington D.C., June, 1972).

Based upon community profiles prepared by Arizona Office of Economic Development and Planning and Riverside, California County Department of Development, 1977.

Following is an analysis of specific communities along the routes.

Maricopa County, Arizona

Buckeye CCD, including the Harquahala Valley and Tonopah

The Buckeye CCD in Maricopa County includes the town of Buckeye and nearby agricultural areas in the Harquahala Valley and around Tonopah. It contains the site of the PVNGS. A total of 26 interviews were conducted in this area. Six of those interviewed worked in agriculture and seven were retired. The remainder were occupied in local government, operated small businesses, or were engaged in one of the professions.

The dominant values, beliefs, and behavior patterns of residents are consistent with what may be called the western "pioneer" frame of mind. Such individuals tend to be independent, self-reliant, and convinced that the agrarian way of life is the best possible. Local residents indicate that there is general agreement on values in the area.

Yuma County, Arizona

The permanent population of the area is generally homogeneous in social and cultural characteristics. The towns are strained in trying to provide social services to large transient populations of so-called "snowbirds."

Attitudes and values of permanent residents of Quartzsite, Bouse, and nearby communities are basically rural and agrarian oriented. Because so little of the area is privately owned (approximately 7 percent of Yuma County), full-time residents view land use planning and decision making by extra-local agencies and organizations with considerable concern.

Residents of the Quartzsite area expect and accept the seasonal migration of "snowbirds" into their area They view other outsiders, however, with a certain degree of suspicion and distrust. Some of the respondents frankly voiced a preference that their communities go on without change. However, the majority of the respondents left the impression that the friendliness of local residents would be extended to newcomers.

Riverside County, California

Palo Verde CCD, especially Blythe

Blythe and the nearby communities of Ripley and Palo Verde are located in Riverside County in Palo Verde Valley along the Colorado River and the Arizona-California border. The area is compact, wedged between the desert to the west and the river to the east. A total of 27 interviews were conducted here, mostly with farmers and others in agriculture related occupations. The remaining interviews were conducted with local officials, businessmen, and professionals. Most residents of the Palo Verde CCD were born and reared there, and many families have resided in the area for several generations and identify with and feel strongly about their community.

Table 2-21 reflects the extent to which residents of Blythe and adjacent areas resemble the populations of the Buckeye and Quartzsite districts in the way they rate their community. While some services fare poorly, the friendliness of people in the Palo Verde Valley is rated a big plus.

Chuckwalla CCD to Desert Hot Springs CCDs

The central portion of Riverside County, California, including the communities of Desert Hot Springs, Palm Springs, Thousand Palms, Indio, Coachella, and Desert Center, makes up the last area for the purposes of this review. The sociocultural characteristics of this area were addressed in a statement prepared by Natelson Company for the BLM, so the subject is treated quite briefly here (Natelson Company, 1976). A total of 14 interviews were conducted for this statement to verify existing data.

The interviews were designed to probe for specific feelings about the community and its quality. Ratings are tabulated in table 2-22.

The Agua Caliente Band has its tribal headquarters in Palm Springs, in the center of the Palm Springs desert resort area. The reservation has a total land area of 25,898.84 acres (10,489 ha), 24,761 acres (10,028 ha) of which are allotted and owned by individuals and 1,137.84 acres (460.8 ha) of which are tribally owned. The Kofa Route does not cross any part of this reservation, but the Brenda Route would cross approximately 2 miles (3.2 km) of Agua Caliente allotments. Thirty of 171 tribal members live in or near Palm Springs, but none live on or near the allotments that would possibly be crossed by the transmission line. Sections that would be used by the Brenda Route are individually owned by absentee allottees.

TABLE 2-21

COMMUNITY RATINGS OF THE PALO VERDE CCD
(Especially Blythe)

Question: How is this area...	Percent Responding			
	Excellent	Good	Fair	Poor
...as a place to raise a family	17	58	17	17
...as a place with adequate health and medical facilities	00	50	27	23
...in terms of the quality of schools	00	33	33	33
...adequacy and quality of water supply	04	42	42	12
...opportunities for cultural refinement (theater, art, etc.)	00	14	14	72
...availability of good jobs for young people	00	28	24	48
...opportunity for earning a liveable income	04	46	29	21
...availability of suitable housing	00	17	25	58
...adequacy of law enforcement and police protection	09	81	05	05
...quality of the physical environment	28	40	32	00
...availability of good shopping facilities	00	25	37	16
...effectiveness of local and county governments in meeting community problems	10	37	37	16
...friendliness of the people	36	56	08	00

The number of responses was 27.

Source: Harbridge House, Inc., 1977.

TABLE 2-22

COMMUNITY RATINGS OF CHUCKWALLA TO DESERT HOT SPRINGS CCDs

	Percent Responding			
Question: How is this area...	Excellent	Good	Fair	Poor
...as a place to raise a family	40	30	00	30
...as a place with adequate health and medical facilities	33	33	22	11
...in terms of the quality of schools	25	38	12	25
...adequacy and quality of water supply	25	75	00	00
...recreational opportunities	17	67	16	00
...availability of good jobs for young people	00	09	00	91
...opportunity for earning a liveable income	17	33	17	33
...availability of suitable housing	25	12	13	50
...adequacy of law enforcement and police protection	10	60	00	30
...quality of the physical environment	62	31	00	07
...availability of good shopping facilities	09	36	09	46
...effectiveness of local and county governments in meeting community problems	15	33	15	32
...friendliness of the people	44	33	22	00

The number of responses was 14.

Source: Harbridge House, Inc., 1977

NATIVE AMERICAN CULTURAL VALUES

In response to a recently passed California State Law (Public Resources Code 5097.9-5079.97, July 1, 1977, which requires the identification, evaluation and protection of Native American cultural values from adverse impact by government-sponsored projects), the California Public Utilities Commission and the BLM requested the applicant provide information concerning Native American cultural values within the study area, and identify mitigation measures adequate to preserve these cultural values.

In March, 1978, the applicant contracted with Cultural Systems Research, Inc. (CSRI) for an ethnographic report which would address these resources.

CSRI contacted numerous Native Americans, interfaced with the Native American Heritage Commission, several tribal business committees and councils, and many individual Native Americans in order to assess and evaluate the potential impact within the study area. Numerous scholars from the anthropological/historical community were also contacted for pertinent information. Archaeological records were examined and field surveys were done in order to discover sites or areas which might be of concern to the Native American community.

In October, 1978, the applicant delivered a copy of the CSRI ethnographic report entitled: Persistence and Power: A Study of Native American Peoples in the Sonoran Desert and the Devers-Palo Verde High Voltage Transmission Line to the BLM Yuma Office for review.

According to the CSRI report, primary values held by Native Americans for cultural resources within the study area include (1) botanical resources (primarily plants used for food, basketry and medicinal purposes), (2) sacred areas or sites (burial and cremation sites, shrines, and general areas associated with religious concepts), (3) zoological resources (animals now hunted for food, and animals which have symbolic significance in sacred traditions and literature), (4) all types of prehistoric archaeological sites (trails, campsites, intaglios, rock art, etc.), and (5) areas of former occupation or use (hunting, gathering, farming and mining areas, the Colorado River flood plain, and the native palm groves of the Coachella Valley).

Appendix (C) of the CSRI report lists 451 sites or areas which are considered to have cultural resource value to Native Americans. Each site or area is assigned a sensitivity level, a mitigation recommendation and an impact rating. Of the above 449 sites or areas, 264 are judged by CSRI to need no type of impact mitigation measure. Recommendations for the remaining 187 sites or areas range from site recordation (photography and data gathering) to further study, to

total site or area avoidance. Of the 187 listed sites or areas judged to need mitigation work, 173 are archaeological sites, while the remaining 14 are larger mountain or plain areas considered sensitive for ethnohistoric, ethnological or ethnobotanical reasons.

Of the 173 archaeological sites listed for impact mitigation work, all but about ten sites were previously known and have been considered in the cultural resource evaluations of this ES. It is the opinion of the BLM Archaeologist that the newly acquired knowledge (as of October, 1978) concerning the ten archaeological sites will not alter the already assigned levels of site density, sensitivity and impacts as are currently shown in the ES cultural resource charts and maps.

The remaining 14 areas are much more difficult to assess for actual cultural values because (1) these areas are generally extensive, and without defined boundaries, and (2) the Native American community has not, and in some cases, will not (due to religious reasons) reveal site-specific data on location or content of areas they consider important. Table 2-23 lists these general areas and their respective cultural values, as identified in the CSRI report.

TABLE 2-23

NATIVE AMERICAN CULTURAL VALUES
NOT CONSIDERED IN OTHER TABLES AND MAPS

	AREA	CULTURAL SENSITIVITY
1.	Palo Verde Mesa west of the Colorado River	Occupation and Cultural Heritage
2.	Mining Areas South of Ehrenberg and Quartzsite	Ethnohistoric
3.	La Posa Plains	Ethnobotanic
4.	Kofa Mountains	Ethnobotanic, Ethnographic, and Ethnohistoric
5.	Little Horn Mountains	Historic Plant Exploitation, Oral Traditions
6.	Ranegras Plains	Medicinal Plant Gathering
7.	Eagletail Mountains	Ethnohistoric Sensitivity to Rock Art, Oral Traditions
8.	Harquahala Plains	Ethnohistoric, Occupational
9.	Gila Bend Mountains	Ethnohistoric
10.	Plains between Palo Verde Hills and Gila Bend Mountains	Ethnohistoric
11.	Palo Verde Hills	Ethnohistoric, Ethnobotanic
12.	Bear Hills	Ethnohistoric, Sensitivity to Burial Sites
13.	Saddle Mountain	Ethnohistoric, Ethnobotanic
14.	Colorado River Flood Plain	Ethnohistoric, Occupational

FUTURE ENVIRONMENT WITHOUT THE PROPOSED PROJECT

On a general level, the future environment of the study area (including all on-going natural processes and human activities) is expected to remain essentially unchanged during the projected 50-year life span of the project. Current growth trends in population, local economy, and land-use patterns are expected to continue in the future. Current limitations on available fresh water will continue to discourage increased economic development. Table 2-24 depicts projected population growth for the study area between 1976 and 2030.

Some limited changes are, however, expected in current growth and use patterns. Continued urban growth, in the major Arizona and California metropolitan areas, will increase public recreational use of the deserts, mountains and Colorado River. Increased recreational use of the study area will result in additional stress and impacts on existing environmental resources. Temporary weekend population increases will create greater competition for limited public and private recreation facilities and services.

Other changes, as indicated by present trends within the study area include (1) projected increasing development of resort, recreational and retirement communities in the Coachella-Indio-Palm Springs areas of Coachella Valley, and (2) with potential Central Arizona Project water, the Harquahala and Tonopah Valley areas may increase the amount of cropland in production, however no significant future changes in population or the primary agriculture-based economic pattern are expected.

Also, it is probable that the future environment of the study area, without the proposed transmission line, would require further proposals for another transmission line route by the applicant or other California entities. It is inevitable that a transmission line will be built somewhere beween the PVNGS and the Southern California coastal cities. (Harbridge House, Inc., 1977.)

TABLE 2-24

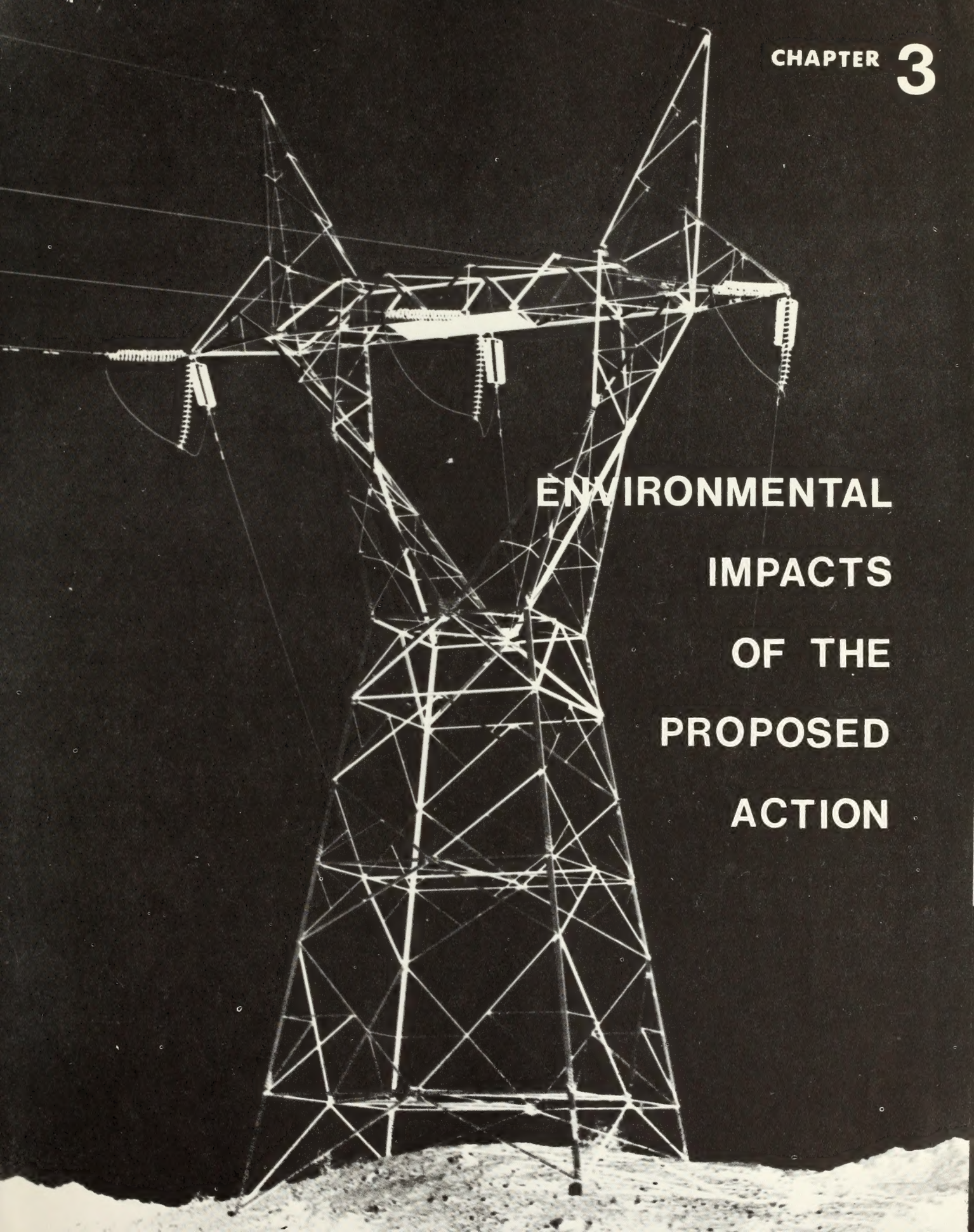
NUMBER OF INHABITANTS, IN CCDs, 1976 - 2030

County/CCD	1976 Number of Inhabitants	1976 Percent of County Population	1980 Number of Inhabitants	1990 Number of Inhabitants	2000 Number of Inhabitants	2010 Number of Inhabitants	2020 Number of Inhabitants	2030 Number of Inhabitants	2030 Percent of County Population
MARICOPA, ARIZONA	1,300,000*	100.0	1,469,500	1,827,000	2,185,000	2,543,000	2,901,000	3,259,000	100.0
Buckeye CCD	7,920	0.6	8,000	8,180	8,360	8,540	8,720	8,900	0.3
County Subtotal	7,920	0.6	8,000	8,180	8,360	8,540	8,720	8,900	0.3
YUMA, ARIZONA	74,900*	100.0	73,500	89,600	105,700	121,800	137,900	154,000	100.0
Parker CCD	16,575	24.4	22,600	32,800	37,800	42,800	46,800	50,800	33.0
County Subtotal	16,575	24.4	22,600	32,800	37,800	42,800	46,800	50,800	33.0
RIVERSIDE, CALIFORNIA		547,600	100.0	615,850	714,700	813,550	912,400	1,011,250	1,110,100
Chuckwalla CCD	4,070	0.7	4,200	4,540	4,880	5,220	5,560	5,900	0.5
Coachella CCD	42,690	7.8	45,600	54,350	63,100	71,850	80,600	89,350	8.1
Desert Hot Springs CCD	5,845	1.1	7,900	10,500	13,100	15,700	18,300	20,900	1.9
Palm Desert/ Cathedral City CCD	32,300	5.9	40,800	63,350	85,900	108,450	131,000	150,000	13.5
Palm Springs CCD	28,710	5.2	35,700	44,600	53,500	62,400	71,300	80,200	7.2
Palo Verde CCD	12,610	2.3	12,900	14,250	15,500	16,750	18,000	19,250	1.7
County Subtotal	126,225	23.0	147,710	191,590	235,980	280,190	324,760	365,600	32.9
TOTAL COUNTIES	1,922,500*	100.0	2,158,850	2,631,300	3,104,250	3,577,200	4,050,150	4,523,100	100.0
TOTAL CCDs	150,720	8.1	178,310	232,570	282,140	331,530	380,280	425,300	9.4

Sources: Arizona Department of Economic Security, Population Estimates of Arizona as of July 1, 1976 (Phoenix, Arizona, 1977).

California Department of Finance, Statistical Abstract of California (Sacramento, California, 1977).

* 1977 Estimates, Arizona Department of Economic Security, Population Estimates of Arizona as of July 1, 1977, Phoenix, Arizona, June 1978.



CHAPTER 3

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

CHAPTER 8

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

CHAPTER 3

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

INTRODUCTION

Adverse and beneficial impacts described within this section are those impacts which may occur to the existing environment in the event the applicant's proposed transmission line is constructed.

Potential impacts are discussed and described in relation to the Brenda and Kofa Routes described in chapter 1. Subalternate routes are analyzed in chapter 8. For the purpose of analysis, it was assumed that the proposed transmission line right-of-way will follow a route within the 2-mile (3.2 km) corridors which were studied, but not necessarily the centerline of those corridors. Maps 3-1 and 3-2 present a summary of the impacts by resources. Where impacts vary at any one point along a corridor the worst case impact is shown.

Potential impacts include the following:

Those which occur as direct impacts within the corridors.
Those which may occur outside the corridor but within the general study boundary identified.

CLIMATE

No effects on the climate of the study area due to this action are anticipated.

AIR QUALITY AND NOISE

AIR QUALITY

If the Palo Verde-Devers transmission line is constructed, a temporary (about 16-1/2 month period) decrease in air quality in the region immediately adjacent to the transmission line and communication sites is anticipated. Construction activities will destroy or disturb the soil surface layer and cause fugitive dust particles to be released into the atmosphere. When construction is complete there will be a gradual decrease in fugitive dust levels. It will take several decades before soils and plants return to their natural state. (Oreana-Hunt Environmental Statement, 1977.)

The degree of fugitive dust impact depends on the amount of soil disturbance, soil moisture content, influencing winds and soil types. (Fluvents and Psamments soils will generate most fugitive dust.) Estimates of fugitive dust impact levels on air quality in the Brenda and Kofa corridors are shown by mileposts in figure 3-1. High fugitive dust impacts are expected to occur along approximately 17 percent of the Brenda and Kofa corridors. Medium fugitive dust impacts are expected to occur on about 68 percent of the Brenda corridor and along 63 percent of the Kofa corridor. Potential impacts to air quality are similar in the two corridors.

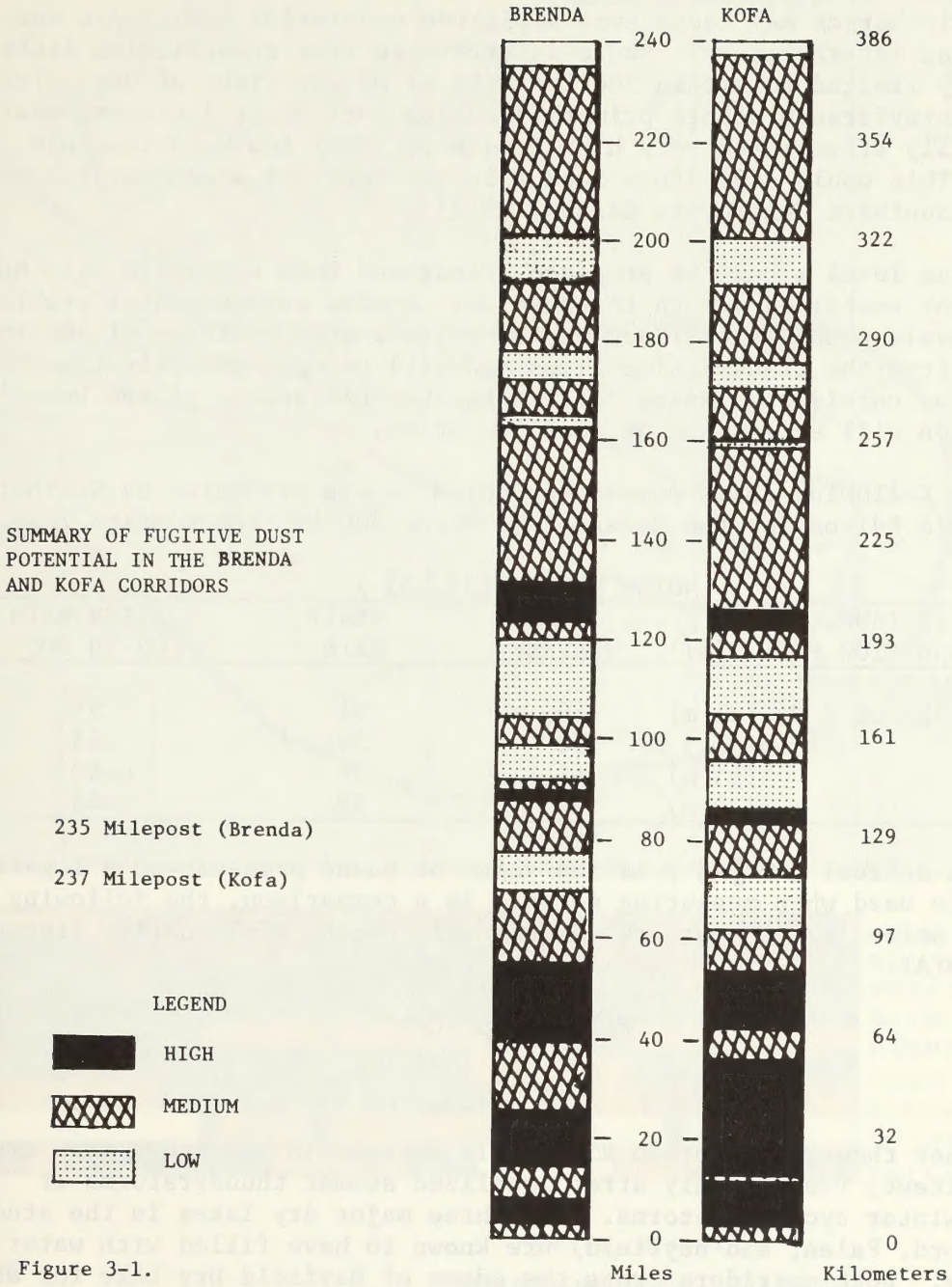
Air quality reduction due to construction of the transmission line, communication sites, and substation enlargement will be minimal, even though particulate standards might be exceeded sporadically in localized areas. The only significant air quality impact, if any, due to these activities will be experienced by the construction crews. Uncontrolled fugitive dust emissions might also create temporary aesthetic impacts.

During operation of the proposed transmission line, communication sites, and substation enlargement, infrequent fugitive dust and exhaust emission from maintenance vehicles and aircraft can be expected from disturbed areas. These impacts will be minimal and of short duration.

Carbon monoxide and hydrocarbons produced in operation of heavy vehicles and construction equipment will be released into the atmosphere. Exhaust emissions will affect air quality, but rapid dispersal and dilution near the source is expected. Impact on air quality by these pollutants will be extremely low. The production of ozone by energized transmission lines is not expected to be significant, nor of long duration. Additional powerlines in the Brenda and Kofa corridors will have minimal effect on air quality.

NOISE

An increase in noise level is anticipated along the transmission right-of-way during construction activities. Audible noise level due to corona discharge can be expected to increase 10 to 20 dB (A) during inclement weather. Inclement weather occurs approximately 33 days per year. Operation of the transmission line will increase noise levels about twice a year. Such increases will result from aircraft patrol flights, occasional maintenance vehicles, and corona discharge. Corona discharge is caused when an electric field forms in the air surrounding energized conductors. A hum or crackling noise is characteristic. The ambient noise level should remain constant in all areas along the transmission line. These noise levels will be low and of short duration. In



SUMMARY OF FUGITIVE DUST POTENTIAL IN THE BRENDA AND KOFA CORRIDORS

235 Milepost (Brenda)

237 Milepost (Kofa)

Figure 3-1.

Source: BLM Team

low signal strength areas adjacent to the proposed transmission line, corona discharges may cause some amplitude modulation (AM) radio and television interferences. Radio interference from transmission lines is generally limited to within 300 feet (92 m) of the right of way. Television interference occurs primarily during periods of inclement weather and usually affects the very high frequency (VHF) low band channels (2-6). This would constitute impact in the corridor area (Environmental Report, Southern California Edison, 1977).

Noise level along the proposed Brenda and Kofa corridors will not be high or sustained enough to cause any adverse environmental problems. Noise levels probably will not be significant at a distance of 400 feet (122 m) from the transmission lines and will be approximately the same in the two corridors. Noise related to the enlargement of the Dever's Substation will be low and of short duration.

The following chart summarizes noise levels predicted by Southern California Edison for the Devers-Palo Verde 500 kV transmission line.

NOISE LEVELS (dB [A])

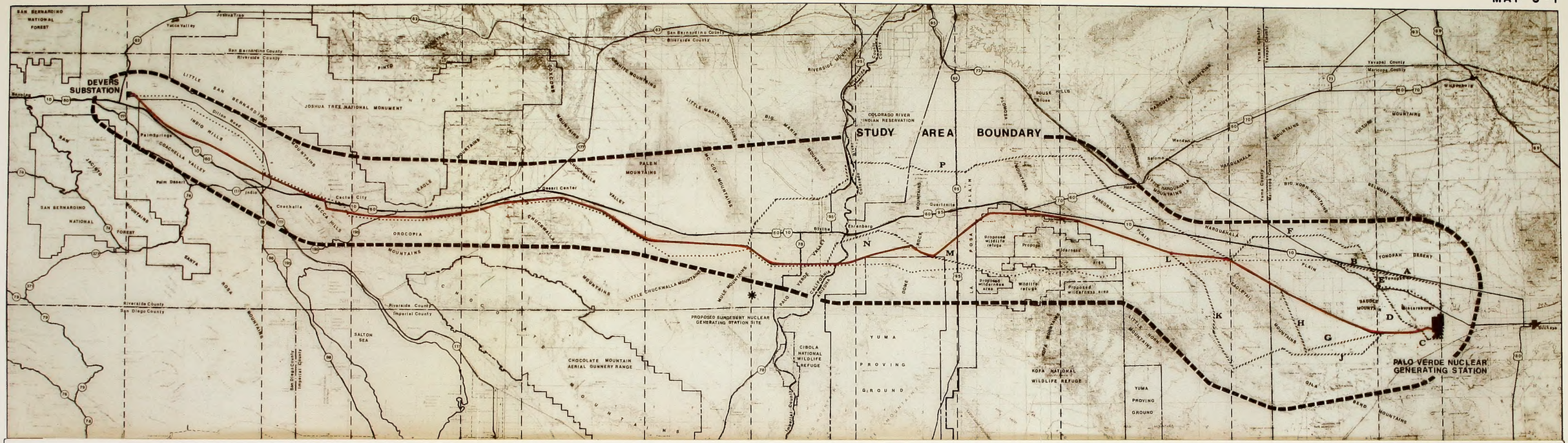
LATERAL DISTANCE FROM OUTER CONDUCTOR FEET (m)	FAIR WEATHER	HEAVY RAIN	AFTER RAIN OR IN FOG
68 (edge of R/W) (21 m)	46	61	55
100 (31.5 m)	44	59	53
200 (61 m)	41	56	50
400 (122 m)	37	52	46

The decibel (dB [A]) is the value of sound pressure on a logarithmic scale used when measuring noise. As a comparison, the following typical noise levels are: conversational speech, 60-70 dB(A), library, 30-40 dB(A).

WATER RESOURCES

SURFACE

Other than the Colorado River, all streams in the study area are intermittent, flowing only after localized summer thunderstorms or during winter cyclonic storms. The three major dry lakes in the study area (Ford, Palen, and Hayfield) are known to have filled with water recently. Both corridors cross the edges of Hayfield Dry Lake for about one-half mile (.8 km). One or two tower sites and access roads for this distance would be sited on the dry lake bed and therefore subject to potential flood.



0 5 10 20 MILES

0 10 20 KILOMETERS

N

ROUTES UNDER STUDY
BRENDA
KOFA
SUBALTERNATES
A

BRENDA ROUTE - SUMMARY OF IMPACTS

SOURCE: SEE TEXT

LEGEND
HIGH
MEDIUM
LOW
NONE

UNITED STATES
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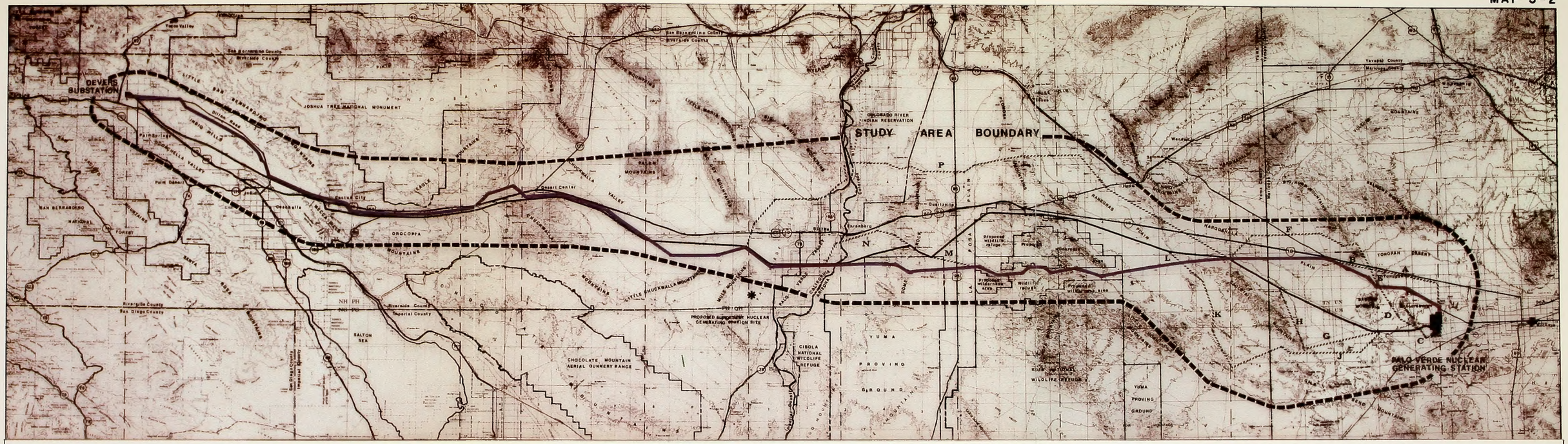
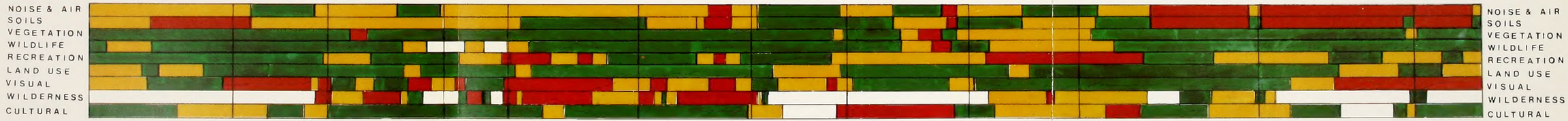
BUREAU OF LAND MANAGEMENT
PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

SUMMARY OF ANTICIPATED IMPACTS BRENDA

MAP 3-2





0 5 10 20 MILES

0 10 20 KILOMETERS

N

ROUTES UNDER STUDY
BRENDA
KOFA
SUBALTERNATES
A

KOFA ROUTE - SUMMARY OF IMPACTS

SOURCE: SEE TEXT

LEGEND

HIGH
MEDIUM
LOW
NONE

UNITED STATES
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PALO VERDE-DEVERS 500KV TRANSMISSION LINE

SUMMARY OF ANTICIPATED IMPACTS KOFA

Major drainage areas of concern impacting Brenda and Kofa Routes are: Centennial, Bouse, Tyson, the Colorado River, McCoy, and those on the west side of the Little San Bernardino Mountains. In spite of flood control structures, Centennial Wash could still carry large quantities of water during a major storm. The flood-prone area for the Brenda Route in a 100-year flood in Centennial Wash is known to be 1- to 2-1/2-miles-wide (1.6 to 4 km). Access roads, and three to eight tower sites and equipment pads could be affected in the event of heavy storm. Drainage from Bouse and McCoy Washes is expected to be minor where the Brenda and Kofa Routes cross them. Possibly 1-mile (1.6 km) of both routes would be affected by each wash. This would pose a flood threat to possibly three tower sites in each area. Tyson Wash appears to have a flood-prone area of about 1-mile (1.6 km) for a 100-year flood, and three tower sites could possibly be damaged by high water.

No extensive flooding is anticipated on either route where they cross the Colorado River due to extensive control measures. The drainages flowing to the southwest out of the Little San Bernardino Mountains near the Indio Hills would present a hazard at the south end of the Indio Hills and in the area between the Little San Bernardino Mountains and the Indio Hills. Flash flooding and sheet wash can be expected in this area during the rainy seasons, and magnitude could be great enough to damage a tower site. Approximately 20 miles (32.2 km) of the Kofa Route will lie within this area, and about 10 miles (16 km) of both routes may be affected to the southeast. Therefore, access roads to the transmission line, 99 tower sites, 10 pulling stations, and possibly one construction yard and batch plant may be subject to flood impact.

Flash flooding may also occur in the Dome Rock and Plomosa Mountains. About 12 miles (19.4 km) of line may be affected along both routes in the Dome Rock Mountains, and a similar distance along the Brenda Route in the Plomosa Mountains may be impacted. Within these 12 miles (19.4 km), access roads, about 40 tower sites and equipment pads, and possibly four pulling stations may be impacted.

Since all drainages except the Colorado River are ephemeral, impacts on surface water during the construction and abandonment phases of the proposed action would be minimal. There should be no impact on surface water during the operation phase. Oil spills, toxic chemicals, litter, and loose material resulting from road construction would constitute a short-term impact if not removed. That is, these materials and substances would probably be carried during the first flash flood after construction or abandonment.

Surface-water flow may damage or wash away tower sites and equipment pads, construction yards, pulling stations, and access roads if these are placed in drainages or should cross them. Map 2-1 should be

referred to for the location of drainages along the routes, and a comparison of surface-water impacts on both routes is shown in table 3-1.

TABLE 3-1

SURFACE WATER IMPACTS TO TOWER SITES

DRAINAGE	ROUTE	TOWER SITES	MILES	KILOMETERS
Centennial Wash	Both	3 - 8	1- 2-1/2	1.6 - 4
Bouse Wash	Both	3	1	1.6
McCoy Wash	Both	3	1	1.6
Tyson Wash	Both	3	1	1.6
Little San Bernardino Mountains	Kofa	66	20	32.2
Little San Bernardino Mountains	Brenda	0	0	0
South of Indio Hills	Both	33	10	16.0
Dome Rock Mountains	Both	40	12	19.3
Plomosa Mountains	Brenda	40	12	19.3
Hayfield Dry Lake	Both	1 - 2	1/2	.8

Source: BLM Team

SUBSURFACE

The proposed powerline should not impact groundwater, but groundwater may impact the powerline. Three areas potentially subject to impact from high groundwater are the Colorado River flood plain, and the Ranegras and Harquahala Plains. The Colorado River flood plain is 7 or 8 feet (2.2 - 2.4 m) higher than the present controlled river level. Most of the flood plain is farmland that is irrigated, creating groundwater mounds and, in some instances, total saturation. The Ranegras and Harquahala Plains normally have groundwater tables well below 100 feet (31 m). However, during the summer, high groundwater conditions occur in irrigated areas. Surface flow in ephemeral streams has also been reported during periods of extensive irrigation.

Along the lower Ranegras Plain and the San Andreas Fault, the groundwater depth is between 20 and 50 feet (6.1 and 15.3 m). The San Andreas Fault forms a groundwater barrier marked by ephemeral sag ponds and a palm tree oasis.

Shallow groundwater conditions in the Colorado River flood plain may exist for approximately 11-miles (17.7 m) along the line, and might affect about 33 tower sites. Impacts on tower site construction and operation should be minor in Ranegras and Harquahala Plains.

Shallow groundwater may affect tower construction in the areas identified by weakening tower foundations, but it should not be a factor elsewhere in the study area. It is also anticipated that as irrigation increases in some agricultural valleys, subsidence cracks may form parallel to mountain fronts and deepen through water erosion. Several manifestations of this process have been observed in the vicinity of Burnt Mountain, in the northern Harquahala Plain. These cracks might prove detrimental if they should occur near transmission towers. Currently, about 12 miles (19.3 km) along the Kofa Route may be subject to this impact. This would affect approximately 43 tower sites and equipment pads in addition to access roads. These factors will be considered in design of the structures.

TOPOGRAPHY

Construction of an electrical transmission line within any of the proposed corridors would not impact the topography in a significant way. Construction of access roads, tower pads, and storage and staging areas would require some alteration of the topography along the right-of-way, but since most of the construction would take place in alluvium filled valleys where the bedrock is not exposed, the environmental impact would be minimal. Minor topographical changes may occur indirectly through the erosion of roads and pads after they are constructed.

Corridors through the Dome Rock and Plomosa Mountains appear to have the steepest slopes, and in these areas benching for crane pads will increase erosion potential. Also, where access roads are constructed in these mountainous areas, flash flooding may bring about the formation of small gullies. The greatest impact to topography would occur along the Brenda Route in the Plomosa Mountains where the line crosses very rugged topography for 4 to 5 miles (6.4 to 8 km).

GEOLOGY AND MINERAL RESOURCES

GEOLOGY

Transmission lines generally have little impact on the geologic environment. Instead, geologic environment affects transmission lines. See geological hazards in this chapter.

MINERAL RESOURCES

Construction of the transmission line would have little impact on known mineral values or on current mining activity. None of the proposed corridors appear to pass through any operating open-pit mining locations with the exception of two active sand and gravel operations near Coachella Valley. Some inactive mines in the Plomosa and Dome Rock Mountains are near proposed routes, however, transmission line corridors will remain open to mineral entry.

The transmission lines will not cross the Known Geothermal Resource Areas (KGRAs) to the south of the study area. If these KGRAs are developed in the future, the lines from a powerplant at these sites could possibly intertie with the proposed lines in this study, but the impact cannot be assessed at this time.

GEOLOGICAL HAZARDS

The proposed transmission lines would not actually impact geology, but may be impacted by several natural geologic hazards that occur in the region. Faulting and seismic activity occur in the area of Coachella Valley, the Little San Bernardino Mountains, and Mecca Hills. Shrink and swell potential is present in expansive soils. There is also slope-instability potential in areas near mountains and hills, especially where seismic activity is prevalent and slopes are steep. There is erosion potential in dunes and other areas susceptible to windblown sand mainly in the vicinity of Chuckwalla Valley. There is also potential for flooding including debris flows from flash flooding in these areas.

Although there are drifting sand dunes in Chuckwalla Valley, they are relatively small and should not present a hazard to transmission tower sites or communication structures.

Slope stability problems may develop as a result of continual mass wasting and erosional processes.

There is slope instability potential along about 8-miles (12.9 km) of either route in the Dome Rock Mountains and on about 5-miles (8 km) of the Brenda Route in the Plomosa Mountains. In California, slope instability may be sensitive along the west side of the Little San Bernardino Mountains, and near Mecca Hills where local seismicity may induce rock falls. Approximately 30-miles (48.3 km) of the transmission line may be affected.

The primary area that may be impacted by seismicity and faulting is in the vicinity of the Indio Hills. A fault scarp can be traced northwestward from the Indio Hills all the way to the Devers Substation. The Indio Hills consist of steeply dipping beds, and faulting with both horizontal and vertical components has occurred on both sides of the hills. The major fault south of the Indio Hills is generally concealed, but trends southeasterly down the Coachella Valley. About 20-miles (32.3 km) of the Brenda Route in this area are subject to impact. Faulting and seismicity appear to be low potential impacts throughout the rest of the study area.

Map 3-3 shows areas of geotechnical sensitivity. Soils are excluded, but areas subject to flooding and debris flow, subsidence, faulting and seismicity, and slope instability are delineated.

SOILS

An estimated 1,286 to 1,392 acres (520-564 ha) would be temporarily disturbed by the proposed construction of the transmission system. An estimated 456 to 559 acres (185-226 ha) would be occupied permanently by system facilities after construction. Major effects on the soil would be caused by survey operations, construction of facilities, and abandonment by exposure to water, wind erosion, compaction, and soil collapse. Soil hazards are summarized by miles and routes in table 3-2. There may be a soil loss of about 19,500 tons (17.700 metric tons) during construction of either route. Mean annual soil loss is estimated at 6,660 tons (6.054 metric tons) per year. The soil displaced by water erosion is carried to adjacent washes, streams and rivers. Some of the soil displaced may travel only a few feet, yet some of the soil may travel hundreds of miles. Selection of either corridor would cause approximately the same soil loss. This soil loss would increase sediment yield about 10.5 acre-feet (4.3 ha) in the affected watersheds. Sediment yield may increase in some downstream waterways, but it will be insignificant. Both sediment yield and soil loss would decrease as ground cover is reestablished. The relatively small loss of soil in the corridor would result in an unknown but probably minor loss in soil productivity. Data was calculated from SCS sediment yield maps and tables.

Impacts on the soils will occur during survey, construction, maintenance and abandonment. Impacts will be high on soils permanently occupied and temporarily disturbed by construction activities. After abandonment of the transmission line, impacts to soils will continue due to exposure and it will take several decades before desert plant cover is completely reestablished.

Vehicle and equipment caused compaction, soil collapse, and erosion will occur on roads and tower and communication sites. Compaction decreases porosity of soil (water and air voids) and infiltration rate; runoff is increased. Collapse of some Fluvents and Argids soils will disturb and displace surface soil. Soil exposure will result from the removal of vegetation for roads, tower and communication sites. The intensity of wind and water erosion from these activities will vary with the soil types affected. Fluvents soils are particularly susceptible to water and wind erosion.

TABLE 3-2

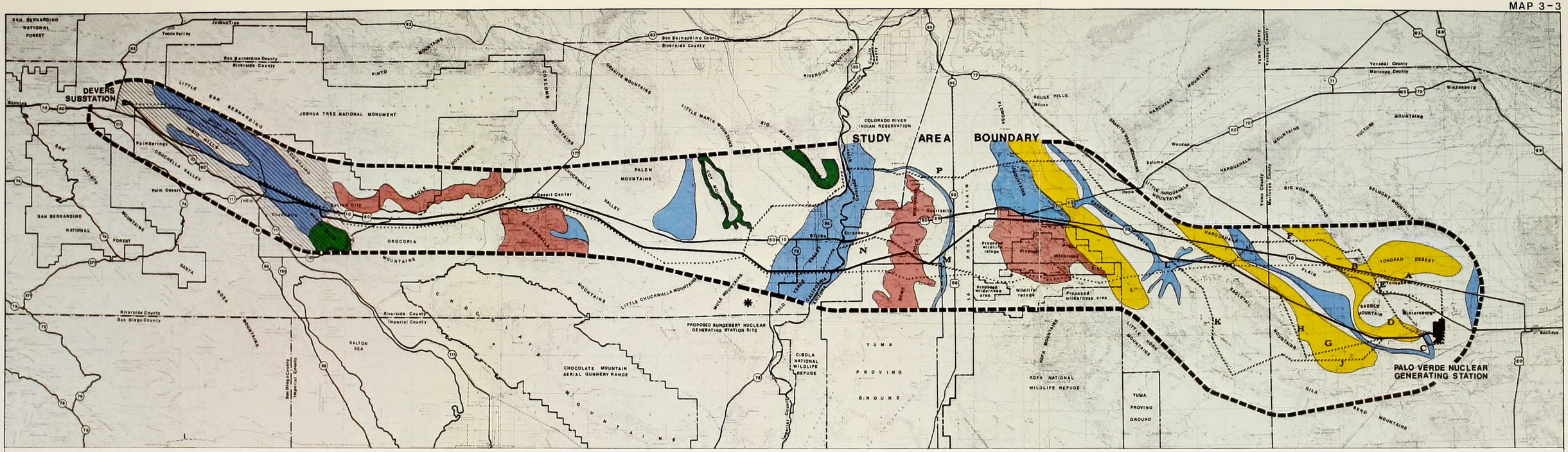
SUMMARY OF POTENTIAL SOIL HAZARDS FOR THE TRANSMISSION ROUTES

Soil Hazards: Soil Erosion, Collapse, Compaction	Brenda Corridor Miles	(km)	Kofa Corridor Miles	(km)
High	51	(82)	72	(116)
Medium to High	32	(51)	31	(50)
Low to Medium	152	(245)	134	(216)

The location of soils with high soil hazards are depicted by routes on map 2-5.

Source: BLM Team

The preparation of tower and communication sites, stringing and pulling sites, construction yard sites, batch plant sites and road clearing will change soils somewhat. Water runoff patterns will be altered creating drainage patterns, new rills and gullies. This impact will be magnified by compaction of road surfaces and other disturbed areas. Where the Brenda and Kofa Routes cross irrigated farming areas in the Palo Verde and Harquahala Valleys, the impacts to the soils will be compaction and soil collapse. These impacts are anticipated on approximately 39.0 acres (15.79 ha) in the Palo Verde Valley and 42.6 acres (17.25 ha) in the Harquahala Valley. Compaction and soil collapse brought about by construction activities



N

0 5 10 20
MILES

0 10 20
KILOMETERS

ROUTES UNDER STUDY

BRENDA ———

KOFA .....

SUBALTERNATES .....

A

LEGEND

- FLOODING, FLASH FLOODING AND DEBRIS FLOWS
- SLOPE INSTABILITY
- DEBRIS FLOWS AND SLOPE INSTABILITY
- SUBSIDENCE
- FAULTING AND SEISMICITY

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

GEOTECHNICAL SENSITIVITY

EXCLUDING SOILS

will increase water runoff and soil erosion. However, these impacts are expected to be short-term and minor.

In summarizing the Brenda and Kofa corridors, the Brenda has 51 miles (82 km) of soils that have high potential for soil erosion, soil collapse, and soil compaction; the Kofa corridor has 72 miles (116 km). These areas are shown on the Soil Association Map 2-5.

VEGETATION

INTRODUCTION

Transmission line towers, pulling stations, construction yards and batch plants will result in the trampling and crushing but not the removal of vegetation; regrowth will take place following construction. New main access roads will require the removal of vegetation for the life of the project, and will result in secondary impacts (i.e., ORV activity) to previously undisturbed areas. Consequently, these roads are considered the most significant impact to vegetation. See table 1-1.

Impact Summary. The Vegetation Impacts Map 3-4 characterizes the impacts on the habitat types by location and intensity, high, medium and low. Criteria for evaluating high, medium and low impacts are as follows:

High Impact. This impact level is anticipated when new access road construction is permitted into high value habitat, unique areas, or State rare and Federal threatened species habitat.

Medium Impact. This impact level is anticipated when existing access roads pass through high value habitat, unique area or State rare and Federal threatened species habitat. Medium impacts are also anticipated where new access roads are constructed in medium value habitats.

Low Impact. This impact level is anticipated where new or existing access roads enter low value habitat or habitat without rare, threatened or endangered species.

When specific locations for towers, pulling stations, construction yards, batch plants and communication sites are identified they may alter impact level evaluations assigned to habitats on map 3-4. Impacts to vegetation are analyzed in the following categories: major habitat types, unique habitats and protected species.

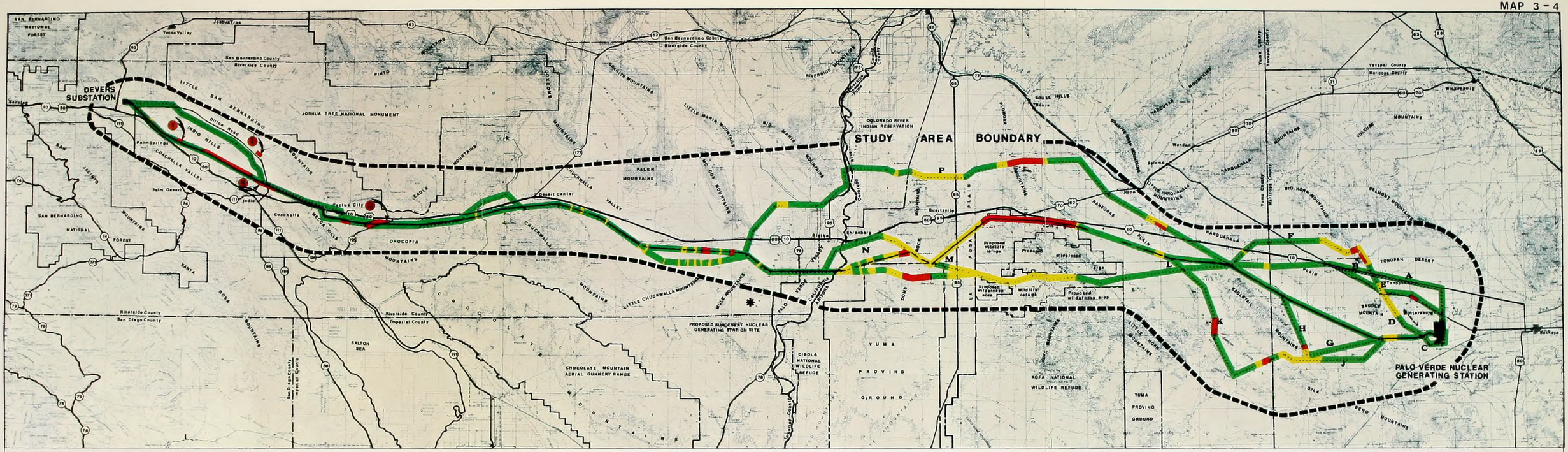
MAJOR HABITAT TYPES

Figure 3-2 quantifies, in distance and area, the amount of vegetation that will be removed in constructing a 20-foot (6.1 m) wide main access road through the major habitat types on map 3-4. The centerline of the corridor was used to calculate length of roads in each habitat type. Areas of disturbance are most extensive in the low-value habitats; creosote bush scrub and creosote bursage flats. Comparison of routes shows that the Brenda Route will require 141 miles (226.8 km) of new road; the Kofa Route will require 93 miles (149.6 km) of new road. During the maintenance phase the 3-foot-wide (.9 m) shoulder on each side of the road will undergo revegetation. Permanent devegetation will remain on 14 feet (4 m) of main access roads.

Vasek, et al (1975) studied revegetation along powerlines in the Mohave Desert. Vegetation along lines built in 1937 and 1970 were compared, providing a 33-year recovery differential for assessment of damage. Major conclusions were as follows: (1) vegetation between towers is somewhat trampled during construction but quickly recovers to a condition at least equal to the undisturbed vegetation adjacent to the right-of-way, (2) a definite enhancement of plant cover along roadsides results, and (3) vegetation under the towers is most severely disturbed during construction. Although changes in vegetation are easily detectable 35 years after construction, substantial recovery occurs during that time period. Also, there is a minor enhancement of vegetative growth under the transmission line conductors.

Construction techniques of much greater destructiveness were noted (Vasek near Lugo, California, 1973) than those employed in constructing transmission lines in 1937 and 1970. The 1973 construction involved complete clearing of extensive areas at each tower site followed by extremely heavy equipment traffic. The cleared areas tended to be L-shaped and occupied areas 132 by 132 feet (40 by 40 m) for towers with a base 30 by 30 feet (9 by 9 m). Adverse impact of tower construction seemed to have increased drastically with modern equipment and technology. Applying worst-case assumptions, impacts might be far more severe than those noted on the 1937 and 1970 lines. Although the studies by Vasek were in the Mohave Desert where rainfall is greater, similar results can be anticipated on the Palo Verde-Devers routes. Lower rainfall in the southeastern desert in California, and the southwestern desert in Arizona, would result in slow revegetation. More than 35 years would be required for recovery and if complete clearing took place, recovery would take centuries.

Resprouting of many desert shrubs occurs if they are cut at the surface of the soil and no subterranean damage occurs. Bulldozer



N

0 5 10 20 MILES

0 10 20 KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

HIGH

MEDIUM

LOW

THREATENED AND RARE SPECIES

MECCA ASTER	MACHAERANTHERA COGNATA	SR. FT.
FOXTAIL CACTUS	CORYPHANTHA VIVIPARA VAR. ALVERSONII	SR. FT.
DESERT BUCKWHEAT	ERIOGONUM DESERTICOLA	SR. FT.
DESERT RATTLEPOD	ASTRAGALUS CROTALARIAE	SR.

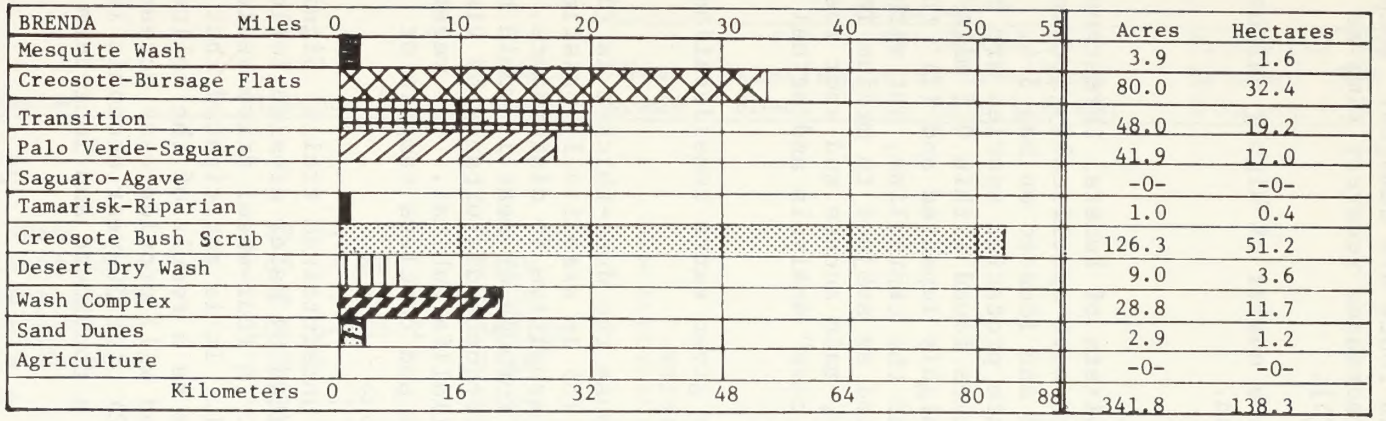
(SR.) STATE RARE
(FT.) FEDERAL THREATENED

SOURCE: BLM TEAM

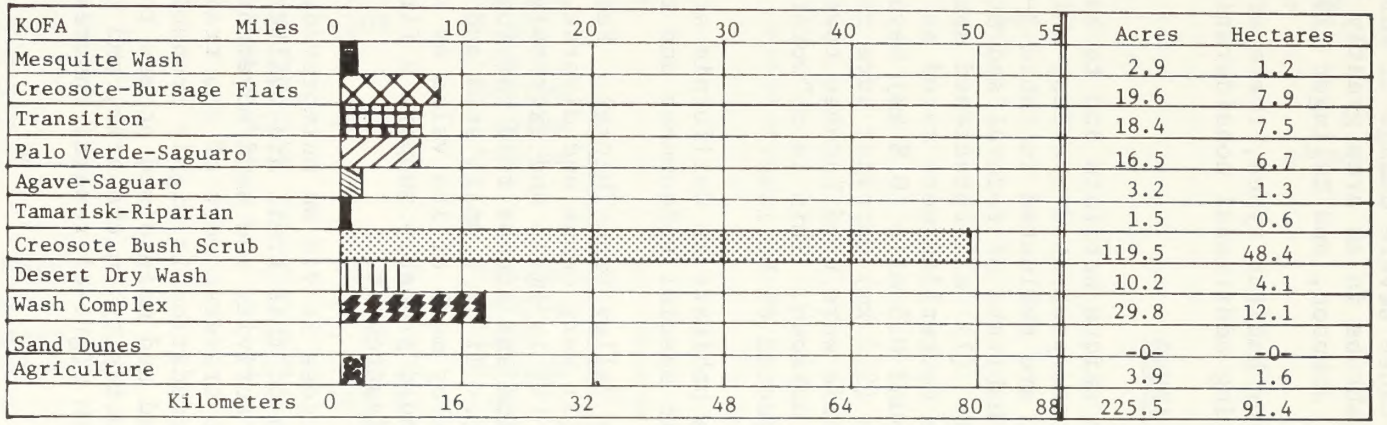
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

VEGETATION IMPACTS



	Acres	Hectares
Mesquite Wash	3.9	1.6
Creosote-Bursage Flats	80.0	32.4
Transition	48.0	19.2
Palo Verde-Saguaro	41.9	17.0
Saguaro-Agave	-0-	-0-
Tamarisk-Riparian	1.0	0.4
Creosote Bush Scrub	126.3	51.2
Desert Dry Wash	9.0	3.6
Wash Complex	28.8	11.7
Sand Dunes	2.9	1.2
Agriculture	-0-	-0-
	341.8	138.3



	Acres	Hectares
Mesquite Wash	2.9	1.2
Creosote-Bursage Flats	19.6	7.9
Transition	18.4	7.5
Palo Verde-Saguaro	16.5	6.7
Agave-Saguaro	3.2	1.3
Tamarisk-Riparian	1.5	0.6
Creosote Bush Scrub	119.5	48.4
Desert Dry Wash	10.2	4.1
Wash Complex	29.8	12.1
Sand Dunes	-0-	-0-
Agriculture	3.9	1.6
	225.5	91.4

Figure 3-2. NEW MAIN ACCESS ROAD IMPACTS ON MAJOR VEGETATION HABITAT TYPES

Source: BLM Team

clearing might cause severe damage if shrub roots are damaged. Complete destruction of shrubs in an area greatly increases recovery time as was noted by Vasek, Johnson, and Eslinger (1975).

Within major habitat types, there are a number of highly unique habitats requiring additional consideration.

UNIQUE HABITAT AREAS

Impacts to unique habitats and to habitats of Federal threatened species, and State protected species, which were specifically located in a field survey, are evaluated in table 3-3 and located on map 3-4. Impacts to the habitats of Federal and State protected species are rated by two criteria: (1) all threatened species found within 0.5 mile (0.8 km) of the centerline were rated as highly impacted and (2) threatened species found 0.5 mile (0.8 km) beyond the centerline, but within the 2-mile-wide (3.2 km) corridor were rated as subject to medium impact. These two criteria were used because tower, main access and spur road locations were unknown. This is a "worst case" analysis and actual impacts are expected to be less.

Two unique habitats in California are given extra consideration because of their special uniqueness and rarity.

Chuckwalla Valley Dune-Thicket. Because the dune-thicket is (1) a rare habitat, (2) very dense and diverse, (3) in essentially pristine condition, and (4) is small and extremely sensitive to disturbance, a transmission line and access road passing through or near it would have a severe impact. It is a small area and frequent disturbance by visitors would destroy much of its value as wildlife habitat. The vegetation density could probably support a fire and careless campers or vandals could destroy it.

Present access is via an unimproved, unmaintained trail. Significant portions of this trail are obliterated by water erosion following tropical storm activity and sand movement. A four-wheel drive vehicle is necessary to traverse most of the trail. It is anticipated that significant degradation is highly probable as a result of the following: (1) an improved and maintained access road will provide easy access and increased ORV activity in the area, and (2) the 50-year economic life of the project with right-of-renewal ensures a continued and long-term impact.

If the SOHIO pipeline is developed, it will be located about 0.9 mile (2.32 km) north of, and almost parallel to, the Brenda centerline. The applicant proposes to use the SOHIO maintenance road instead of constructing a new road through this area.

TABLE 3-3

IMPACTS TO UNIQUE HABITATS AND THREATENED SPECIES HABITATS

Habitat	Milepost[c]	Impact Level	Criteria[a,b]			
			New Roads	Existing Roads	Protected Species Less Than .5 Mile (.8 km)	Protected Species Between .5-Mile and 2 Miles (.8-3.2 km)
BRENDA ROUTE						
Mesquite Wash	49.5- 51.0	Medium	X			
Palo Verde-Saguaro	65 - 80	High	X			
Palo Verde-Saguaro	94 - 96	High	X			
Tamarisk-Riparian	104.6-105.2	Medium	X			
Chuckwalla Thicket	128.6	High	X			
Sand Dunes	123, 128.6	High	X			
Dry Wash	185 -185.6	Medium	X			S[3]&F[3]
Sand Dunes	204 -208	High		X	S[4]	
Sand Dunes	215	Low		X		
Sand Dunes	230	Medium		X		
Palm Oases	209 -217	Medium		X		
Indio Hills	222	Medium		X		S[1]&F[1]
KOFA ROUTE						
Mesquite Wash	33	Medium	X			
French Wash	75 - 77	Medium		X		
Saguaro-Agave	88 - 90.5	High	X			
Tamarisk-Riparian	102 -102.6	Medium	X			
Sand Dunes	120, 121.6	Low	X			
Dry Wash	183 -183.6	Medium				S[3]&F[3]
Creosote Bush Scrub	213	Low		X		S[2]&F[2]

a An X indicates that the criteria was considered an important factor.
b State (S) and/or Federal (F) protected species are present. Numbers refer to Federal threatened species and State rare species as shown in chapters 2 and 3.
c See maps 1-1, 2-6, and 3-4.

Source: BLM Team

Palm Oases. Impacts from increased public access could have a severe effect on declining palm populations. Many of the oases in the Indio Hills are under stress due to low water tables and increased human activity could deplete a weakened stand.

STATE-PROTECTED SPECIES

Arizona The protected native plants that will be impacted within the corridors studied are listed in table 2-5 and include the following genera within the cactus family: Opuntia, Mammillaria, Peniocereus, Carnegiea, Echinocereus, and Ferocactus. Other protected plants encountered are ocotillo, smoke tree, crucifixion thorn, mesquite, little leaf and blue palo verde, and ironwood.

California The following rare and endangered plants have been identified within the transmission line corridors and are noted on maps 2-6 and 3-4 by the following numbers.

1. Mecca aster, Machaeranthera cognata
2. Foxtail cactus, Coryphantha vivipara var. alversonii
3. Desert buckwheat, Eriogonum deserticola
4. Desert rattlepod, Astragalus crotalariae

Other plants considered rare and endangered (Powell, 1974) may exist in the corridor. Based strictly on distribution, one or more of these species may be impacted by construction activities.

5. Glandular ditaxis, Ditaxis adenophora
6. Little San Bernardino Mountain linanthus, Linanthus maculatus
7. Scaly-stemmed sand plants, Pholisma arenarium

FEDERAL-ENDANGERED OR THREATENED PLANT SPECIES (Proposed FWS List)

Species. Individual plants of the following three species, designated proposed threatened by the FWS (Federal Register of July 1, 1975 and June 16, 1976) have been located within the corridors. If construction activities are confined to the designated centerline, none of these individual plants will be destroyed as they occur approximately 1 mile (1.6 km) from the centerline of the corridors studied (map 3-4).

1. Mecca aster, Machaeranthera cognata
2. Foxtail cactus, Corypantha vivipara var. alversonii
3. Desert buckwheat, Eriogonum deserticola

Habitat Considerations. The primary intention of the Endangered Species Act of 1973 is to protect, maintain, and restore endangered and threatened species and the habitat they depend upon, to the extent that such species will no longer be endangered or threatened. The Act

recognizes that the destruction or modification of a species' habitat can result in that species' extinction. Consequently, the primary objective is to protect these species within their natural habitats.

Accordingly, information is being gathered by FWS to assist in delineating spatial environments, including geographical boundaries of critical habitat for endangered and threatened species (Federal Register, 40 FR 17764-17765) April 22, 1975. At the present time, there have been no critical habitat areas designated for these threatened plant species within the study area.

Impacts to the proposed threatened species above have been summarized in table 3-3 and the plant locations are designated on maps 2-6 and 3-4. Their immediate habitats will not be impacted as the plants occur approximately 1 mile (1.6 km) from the corridor centerline.

Mecca star and foxtail cactus are located 1 mile (1.6 km) from, and adjacent to an already existing utility maintenance road. No new road construction will be required in this area; correspondingly, the construction disturbance that will occur to similar habitat is restricted mainly to the tower locations.

Desert buckwheat is located approximately 1 mile from, and adjacent to the centerline of proposed corridor construction. New road construction will impact approximately .6 mile (.96 km) of similar habitat (desert dry wash) of this species.

WILDLIFE

Wildlife as the term is used here is meant to include all natural living species of mammals, birds, and reptiles. These species exhibit a well known reaction of fear or avoidance toward humans, and all need food, cover, water and space to survive.

ANALYSIS PROCEDURE

Information and data that identified various impacts to wildlife were accumulated for this report from State Wildlife Departments in California and Arizona. Woodward-Clyde Consultants conducted an intensive study that identified impacts along the two study routes. See table 3-4 for a list of construction impacts.

IMPACT SUMMARY

Impacts to wildlife have been categorized as high, medium, or low for summary and comparison with impacts to other resources on maps 3-1, 3-2, 8-2, 8-3 and 8-4.

High Impact. This impact is expected in unique or critical habitat of sensitive species, such as bighorn sheep lambing areas.

Medium Impact. This impact level is expected in habitat which is important but not critical to sensitive species, i.e., bighorn sheep habitat other than lambing or watering sites, fringe-toed lizard habitat, etc.

Low Impact. Some impact to wildlife will occur anywhere construction occurs. Consequently, all other areas were rated low impact.

ECOLOGICAL SENSITIVITY

Sensitivity of the two study routes to impacts on wildlife resources appear greater in Arizona due to the crossing of several mountain and valley areas. The routes through California follow a closer parallel course through low elevations and alluvial plains. The known distribution of sensitive wildlife species and unique habitat areas are shown on map 2-7. Both study routes traverse large portions of primary bighorn sheep habitat in Arizona. The Coachella Valley fringe-toed lizard in California is of high interest. Designated areas were not rated or evaluated in this study, but were accepted as such from prior designations by various Government organizations. The bar graph in figure 3-3 shows the total miles of sensitive habitat and designated areas that will be affected by the Brenda and Kofa Routes. Other classified species (tables 2-8 and 2-9) were not evaluated

because of their wide distribution and lack of any known concentrations in the study area. Habitats of these species will be impacted to an unknown degree, however, any impact lends support for specific mitigation measures.

FEDERAL ENDANGERED OR THREATENED WILDLIFE SPECIES

No impacts to wildlife species on the Federal Endangered and Threatened Species List were identified. Therefore, a formal letter of consultation with FWS is not required.

STATE PROTECTED SPECIES

Impacts to these species are covered under the following subheadings by category.

IMPACTS ON SENSITIVE WILDLIFE AND UNIQUE AREAS

The most significant impact to wildlife and unique areas will result from new access roads which are used in construction and maintenance. Figure 3-4 is a summary bar graph showing miles of new access roads through the habitat of sensitive species. This secondary type of impact due to human encroachment in areas of previously limited access is recognized as being greater than direct impacts. The direct impact from construction kills, and disturbance of sensitive animals within a limited habitat is also significant. The impact on predatory species such as mountain lions, coyotes, bobcats, foxes, and other species such as rabbits, skunks, and raccoons is less significant because of their ability to move away from impacts and their wide distribution throughout the study area.

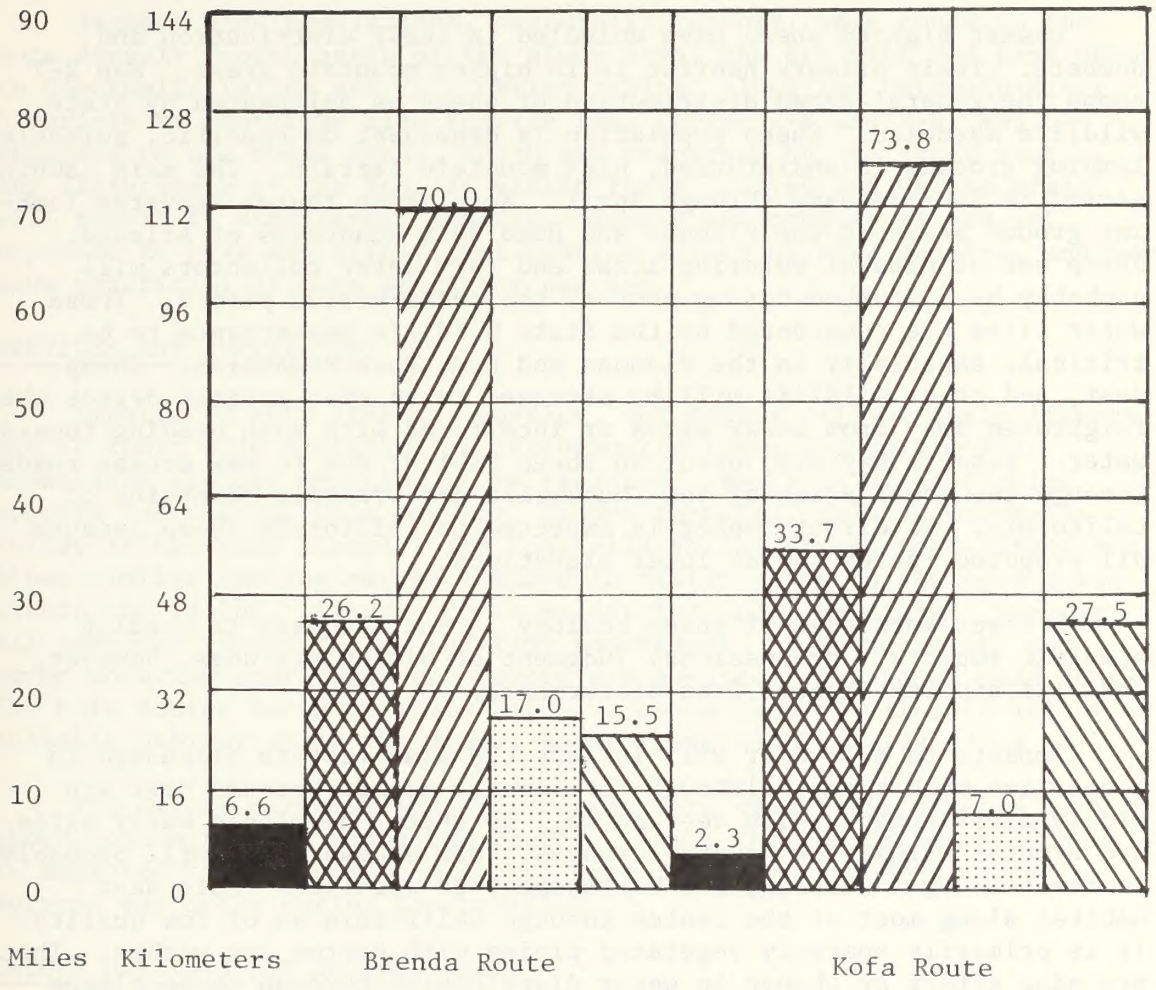
TABLE 3-4

COMPARISON OF SHORT AND LONG RANGE IMPACTS ON WILDLIFE

	Short Range	Long Range
1.	Disturbance of sheep.	Increased public access.
2.	Frightening away from water.	Increase in poaching.
3.	Noise and sight disturbance.	Continuous disturbance.
4.	Mortality from equipment.	Permanent loss of food, cover, and dens on roads and tower sites.
5.	Destruction of dens.	Increased value of plant foods where small drainages terminate at roads.
6.	Accidents and fires.	Habitat loss from soil erosion.

Source: BLM Team

TOTAL MILES OF SENSTIVE HABITAT AND UNIQUE AREAS



Bighorn sheep lambing grounds in high mountains.

Bighorn sheep range in high mountains.

Mountain lion range in upper bajadas to high mountains.

Coachella Valley fringe-toed lizard in sand dunes.

Unique areas - proposed and existing natural areas, wilderness areas, and refuges.

Figure 3-3.

Source: BLM Team

MAMMALS

Desert bighorn sheep have dwindled in their distribution and numbers. Their primary habitat is in higher mountain areas. Map 2-7 shows the general known distribution of sheep as delineated by State wildlife agencies. Sheep population is dependent on specific, suitable lambing grounds in undisturbed, high mountain terrain. The main lambing period is from January through April. Both study routes traverse lambing ground areas in the Plomosa and Dome Rock Mountains of Arizona. Sheep use of natural watering areas and rain water collectors will probably be disturbed during most of the construction period. These water sites are considered by the State Wildlife Departments to be critical, especially in the Plomosa and Dome Rock Mountains. Sheep, deer, and other wildlife will be stressed to an even greater degree when frightened away from water sites or interfered with when heading toward water. Impacts may also occur on sheep habitat due to new access roads through the lower areas of the Chuckwalla and Orocopia Mountains of California. No direct impact is expected on California sheep because all proposed routes lie at lower elevations.

Present knowledge of sheep ecology is not adequate to predict specific impacts. Professional judgment of biologists does, however, indicate adverse impacts from disturbance.

Impacts to mule deer will include the same factors discussed in connection with sheep, although to a lesser degree because deer are widely distributed. With deer as well as sheep, developed water sites are crucial within the mountain ranges. New access roads will probably increase illegal hunting, and harrassment of wildlife. Mule deer habitat along most of the routes through California is of low quality. It is primarily sparsely vegetated plains with narrow dry washes. The new edge effect or change in water distribution through these plains areas may be more beneficial than harmful. The increase in variety and vitality of plants in numerous dry washes can be observed along existing roads through these areas.

Impacts to mountain lions are expected to be minimal because of their large home range and ability to avoid human activities. However, the increase in human encroachment during and after construction may cause the lions to reduce home range size or alter home range boundary.

Some dens and burrows of medium and small mammals will be destroyed in the construction phase. The maximum disturbance of this kind is a very small percentage of the total distribution of rats, gophers, mice, shrews, rabbits, skunks, and badgers. Secondary impacts may occur around the base of towers where cattle and burros tend to accumulate and trample or overgraze.

BIRDS

Highest bird populations, especially raptors, were found in the more densely wooded parts of the study area, the dry wash and sand dunes in Chuckwalla Valley and in riparian habitat along the Colorado River. A variety of sensitive bird species (see tables 2-8 and 2-9) may be expected to use these areas, which are traversed by the study routes. Any disturbance of the habitat within these limited and unique areas will result in significant impacts. Towers and conductors are not expected to have any significant adverse effect on bird species, and may have beneficial effects as raptor perches.

REPTILES AND AMPHIBIANS

Impacts to most lizards, turtles, and snakes will be insignificant due to their wide distribution throughout Arizona and California. Amphibians are not expected to be impacted. Reptiles of particular concern include the Gila monster, desert tortoise, and the Coachella Valley fringe-toed lizard. The Coachella Valley fringe-toed lizard and other similar species may be limited in distribution to the sand dunes within the valley. Impacts on these species would be minimal because all proposed routes follow existing powerlines. Some mortality may occur when new spur roads and towers are constructed through sand dunes. The Kofa Route, north of Indio Hills, crosses about 5 miles (8 km) of suitable habitat while the Brenda Route traverses 17 miles (27.3 km).

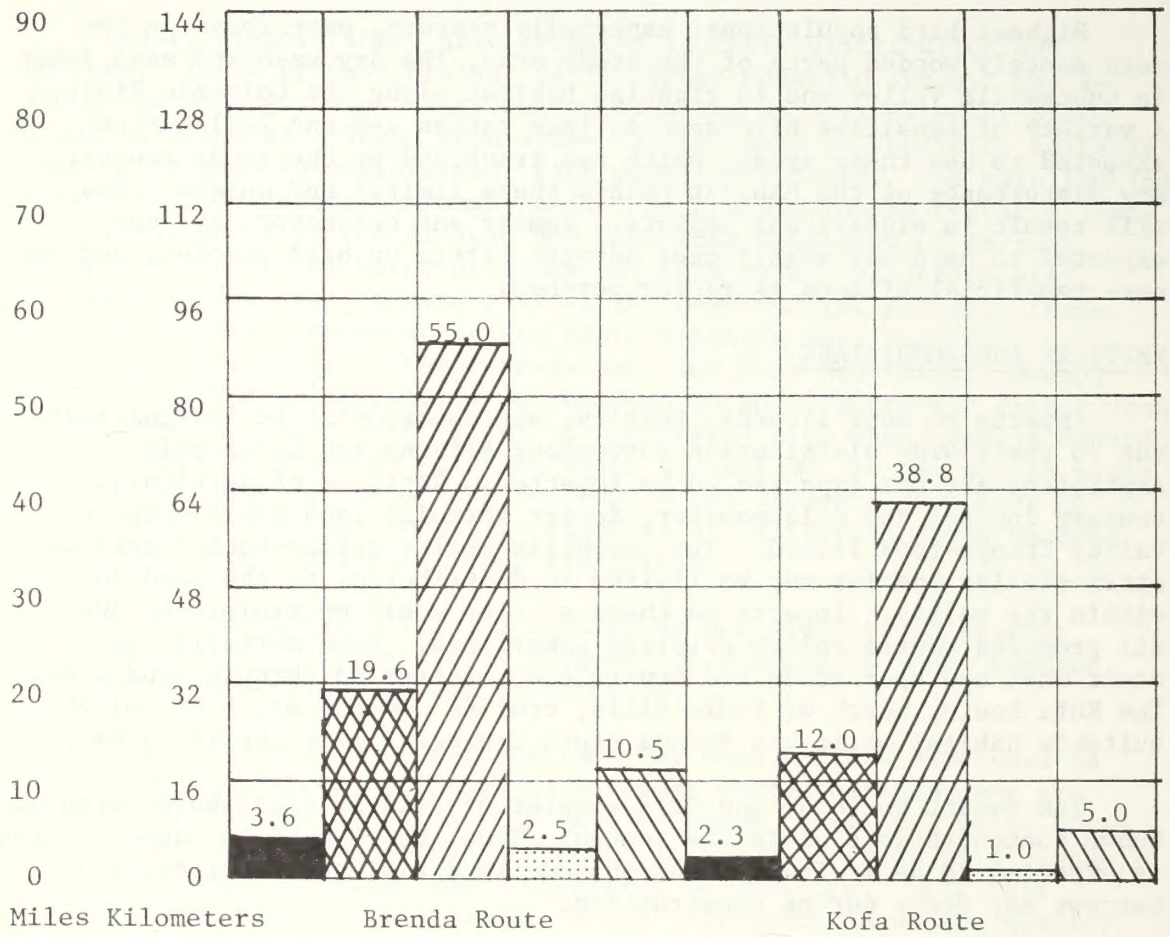
The desert tortoise and Gila monster are widely distributed with no known concentrations along the routes. Thus, the impact to these species is expected to be minimal, although some road kill and destruction of burrows may occur during construction.

UNIQUE HABITATS AND NATURAL AREAS

The Brenda corridor (2 miles wide (3.2 km)) crosses the Jaeger Natural Sanctuary, although the actual centerline as surveyed would be 800-feet (240 m) north of the present boundary. A proposed extension of this area would be traversed by the Brenda and Kofa Routes. Map 2-7 shows the unique habitats and natural areas which will be impacted by each of the proposed routes. The bar graph in figure 3-4 shows the miles of new access roads that will be required through existing and proposed unique areas. This graph corresponds to figure 3-3 which shows the total estimated miles of access roads across designated unique areas.

The Brenda Route traverses 15.5 miles (24.9 km) of unique area, of which 10.5 miles (16.9 km) would require new access roads. This includes 0.5 miles (0.8 km) adjacent to the proposed Eagletail Mountain Natural

MILES OF NEW ACCESS ROAD THROUGH THE HABITAT OF SENSITIVE WILDLIFE SPECIES AND UNIQUE AREAS



Bighorn sheep lambing grounds in high mountains.

Bighorn sheep range in high mountains.

Mountain lion range in upper bajadas to high mountains.

Coachella Valley fringe-toed lizard in sand dunes.

Unique areas - proposed and existing natural areas, wilderness areas, and refuges.

Figure 3-4.

Source: BLM Team

Area, 9.0 miles (14.5 km) through the proposed expansion of the Kofa National Wildlife Refuge, 0.5 miles (0.8 km) of unique sand dunes, 1.0 mile (1.6 km) through the proposed extension of the Jaeger Natural Area, 2.5 miles (4.0 km) adjacent to the proposed Mecca Hills Natural Area, and 2.0 miles (3.2 km) through the proposed Palm Oasis Natural Area. The route could bypass the proposed natural areas in the Eagletail Mountains and in Mecca Hills, and follow an existing road through the proposed Palm Oasis Natural Area. This would leave approximately 10.5 miles (16.9 km) of new access roads through unique areas on the Brenda Route.

The Kofa Route traverses 27.5 miles (44.2 km) of unique area, of which 5.0 miles (8.0 km) would require new access roads. This includes 25.0 miles (40.2 km) through the Kofa National Wildlife Refuge and 2.5 miles (4.0 km) through a proposed natural area. Spur roads into tower sites and diversions from the main access road will be longer through the Kofa National Wildlife Refuge, however, the 5 miles (8.0 km) of new access roads are of low significance because of the existing main road along this portion of the route.

COMMUNICATION SITES

Ten radio communication sites will be used, see summary in chapter 1, table 1-3. These sites are within or adjacent to existing facilities. Disturbance to wildlife is expected to be minimal and temporary because additional construction will require less than 1 surface acre (0.41 ha) at each site.

LAND USE AND OWNERSHIP

Land use impacts will result if the construction or operation of the proposed transmission line causes: (1) a permanent or temporary cessation, disruption or modification of current land use activities; (2) a short-term or long-term reduction in the value of the visual setting for visually sensitive land uses; and (3) a substantial modification of future planning and development opportunities.

Three impact levels have been defined as follows:

High - This would occur if the construction and operation of the proposed transmission line would cause a permanent change in suitability of the land for an existing or proposed land use.

Medium - This would occur if the construction and operation of the proposed transmission line would cause a temporary disruption of the existing or proposed land uses.

Low - This would occur if the construction and operation of the proposed transmission line would cause little or no change to existing or proposed land uses.

No large-scale areal changes in land uses are anticipated as a result of the proposed project. However, there might be some economic losses to operations contiguous to, or near the corridors.

AREAL

The impacts on residential, commercial, industrial and other urban land uses are primarily visual. The Air Quality Section (chapter 3) discusses the effects of corona (noise, and television interference) on urban areas. As a general impact, some commercial, residential and industrial land uses may be prohibited directly under the transmission line and towers. These restrictions are of primary significance for future land use developments as the proposed and alternative routes were selected to avoid removal of existing structures. Areal land use impacts are summarized on map 3-5.

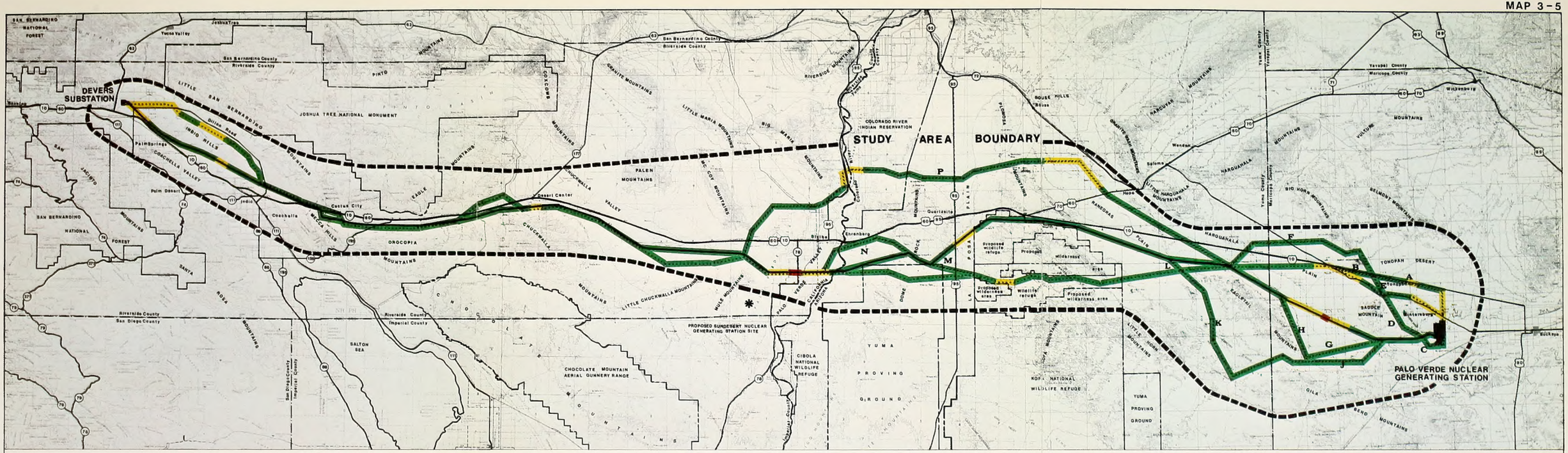
Recreation Resources

The meaning of recreation requires individual definition. Attitudes and expectations are prime factors in what constitutes an impact on the recreational experience. On one hand, the ORV enthusiast may not object to the inclusion of steel towers and powerlines in the environment unless it physically restricts his movement. The development of roads for construction and maintenance may even enhance his recreation experience by increasing access to new areas.

On the other hand, the sightseer or naturalist may strongly object to towers, lines and roads as they affect the pristine qualities of the country which he enjoys. He may object to intrusions because they affect scenic quality for photography or just because they exist. Whatever the rationale, the impact is real to the observer.

Impacts

The impact criteria is designed to overcome the problems of individual definition. Recreation impacts as shown on map 3-6 were identified on the basis of recreation sensitivity. The impacts surfaced in this study may differ from those shown in the Sundesert FES. The Sundesert FES considered wilderness as a part of the recreation activity and the impacts reflect this fact. Primitive values which are addressed within the BLM's Recreation Information System are treated here and may tend to offset the effects of considering wilderness in a separate section. The discussion of these impacts is reduced to alternative routes and degree of impact.



N

0 5 10 20
MILES

0 10 20
KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....A

LEGEND

HIGH

MEDIUM

LOW

SOURCE: BLM TEAM

UNITED STATES

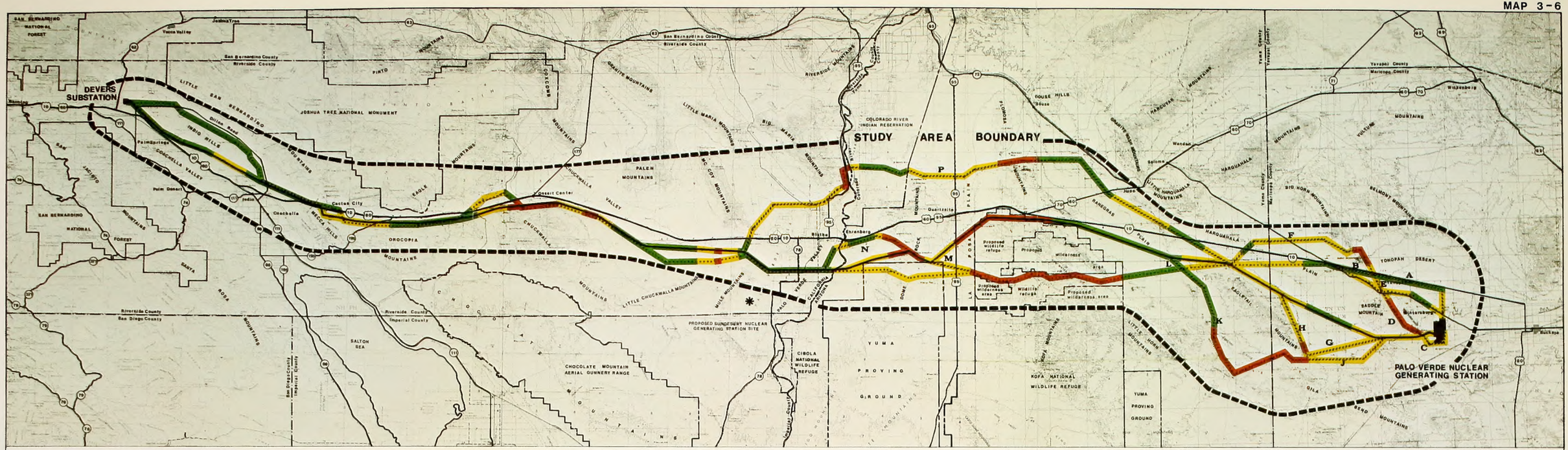
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

LAND USE IMPACTS



N

0 5 10 20
MILES

0 10 20
KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

HIGH

MEDIUM

LOW

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

RECREATION IMPACTS

Kofa

High Impacts

High recreational impacts are anticipated on this route in the area of the Kofa National Wildlife Refuge, Arizona. Impacts would be due to several factors.

The Kofa National Wildlife Refuge is a highly sensitive recreation area. The FWS recently proposed that large portions of the area be given wilderness status. Impacts would be caused by the physical existence of towers and lines. The powerline would follow an existing El Paso natural gas pipeline and construction and maintenance roads would not contrast significantly with existing disturbances caused by the pipeline. The large vertical towers, however, would constitute a radical change from the existing situation and contrast sharply with recreational experiences. The towers would be highly visible at points along the corridor from which the pipeline and other ground disturbances are not visible.

The Wiley Well area, just west of the Mule Mountains, is another highly sensitive recreation use area. The area receives intense winter use by out-of-state visitors as well as by Californians from the coastal areas. The Kofa Route crosses the use area. Wiley Well Campground is in an area designated by the California Desert Vehicle Program as an Open Use Area. Wiley Well Road and Campground are primary access points to this area. Impacts would be caused by the intrusion of towers and lines. The development of construction and maintenance roads may have a beneficial impact, at least to ORV enthusiasts, because more country will be opened to entry. This will not adversely impact the open designation (ORV) of the area.

High recreation use and sensitivity is experienced in the Corn Springs area southeast of Desert Center. The Chuckwalla Mountains are designated as a Class V primitive area. This plus the campground accounts for more than 7,900 visitor use days.

Towers and lines will conflict with primitive values and the E. C. Jaeger Nature Sanctuary south of Desert Center.

Development of construction and maintenance roads will also be an adverse impact in an area identified for "Designated Roads and Trails" use only. Two reasons for restricting access to "Designated Roads and Trails" is to limit access or to restrict the development of additional roads and trails in areas already over allocated. Additional roads or trails constructed during powerline construction will only compound management problems.

Medium Impacts

Medium impacts are generally encountered in those areas having significant annual visitor days of use, but where the powerline corridor does not interfere significantly with recreational activities.

Typical areas in this category are found in the Tonopah and Harquahala Valleys. The impacts are mostly visual in nature. The addition of roads for construction and maintenance may open new ground to vehicle use. This can be viewed either as an adverse or a beneficial impact, depending on point of view.

Although the corridor between the Kofa National Wildlife Refuge and Yuma Proving Ground (YPG) receives a great deal of visitor use, the impacts caused by the presence of the towers and lines are minimized by the presence of the highway and pipelines.

The corridor through YPG receives restricted visitor use; the magnitude of this estimated use indicates a medium impact. This impact will be strictly visual and minimized by the restricted area from which the line and towers will be visible.

Visual impacts will affect recreation experience in the following areas: Wiley Well, Corn Springs, Eagle Mountains, just west of Desert Center, California, and the Mecca Hills.

Low Impacts

Low impacts to the recreational resource and experience are anticipated in the remaining corridor areas (see map 3-6). Most of these areas are already impacted by powerlines, highways or urban developments. The exception to this would be in areas similar to the Chuckwalla Valley, California. In that area, distance to the main recreation use and resource areas tend to negate the impacts of towers and lines.

Brenda

High Impacts

The major area of impacts along this route will be through the proposed extension of the Kofa National Wildlife Refuge. This route differs from the Kofa in that it will not follow an existing development. Although it would parallel the Interstate Highway, distance and terrain will significantly lessen impacts. It will not cross the proposed Kofa Wilderness Area, but will be visible from it. This factor, along with a high recreation sensitivity classification, results in a very high

impact. Impacts would primarily affect the recreation experience, although the addition of construction and maintenance roads would also constitute a physical impact.

Almost as serious will be the impact of the corridor as it crosses the La Posa Recreation site. It is believed that a major powerline crossing this site would cause many present visitors to move elsewhere. This would at least be true as long as no time limit for camping exists on surrounding desert areas. It is believed that those persons presently using the site, do so because of its generally undeveloped aspect and atmosphere.

The Dome Rock Mountains through Copper Bottom Pass are scarred by the existence of a pipeline. The pipeline does not inhibit access because it is largely below ground level. The physical existence of steel towers will constitute a high impact on the recreation experience of the area.

The Wiley Well area and the Orocopia Mountains-Corn Springs area, as discussed concerning the Kofa corridor, will experience high impacts on recreation.

Medium Impacts

As along the Kofa Route, medium impacts are encountered where the proposed corridor traverses recreational resources with a minimum of urban or utility development and a moderate recreational sensitivity. These conditions are found in the Harquahala Valley (somewhat negated by the existing pipeline), the La Posa Plain, the Colorado River Valley Bench, west of Desert Center, California, the Mecca Hills area, and the south slope of the Indio Hills (somewhat negated by the existence of several powerlines).

Low Impacts

As shown on map 3-6, the remainder of the corridor is expected to cause low recreational impacts. This is primarily due to the existence of highways, powerlines, and other intrusions, as well as low recreation sensitivity.

General

Impacts of the proposed corridors as they cross the Colorado River are only moderate. Although visitation is high, the scenic qualities of the riverine area are already lessened by the riprap river banks, levees and adjacent intrusions, especially on the California side of the river.

Also, most visitors are in the area to participate in water sports and it is unlikely that the addition of the proposed powerline will affect this use of the resource. A summary of the various impacts identified is shown on figure 3-5.

Agriculture

The more significant land use impacts (see table 3-5) will be on agricultural areas. Hazards to crop dusting aircraft constitute the greatest impact to these operations.

A study in California (1966 through 1975) involving aircraft accidents with wires and poles showed 85 of 210 accidents involved agricultural aircraft (Sundesert FES). The cause of most of these accidents was the inability of the pilot to see the wire and poles.

Powerlines that are not parallel to the alignment of section lines, and are not located on section lines, present an additional hazard to aircraft. It is more difficult for pilots to judge their distance from lines not perpendicular to their line of flight along crop rows.

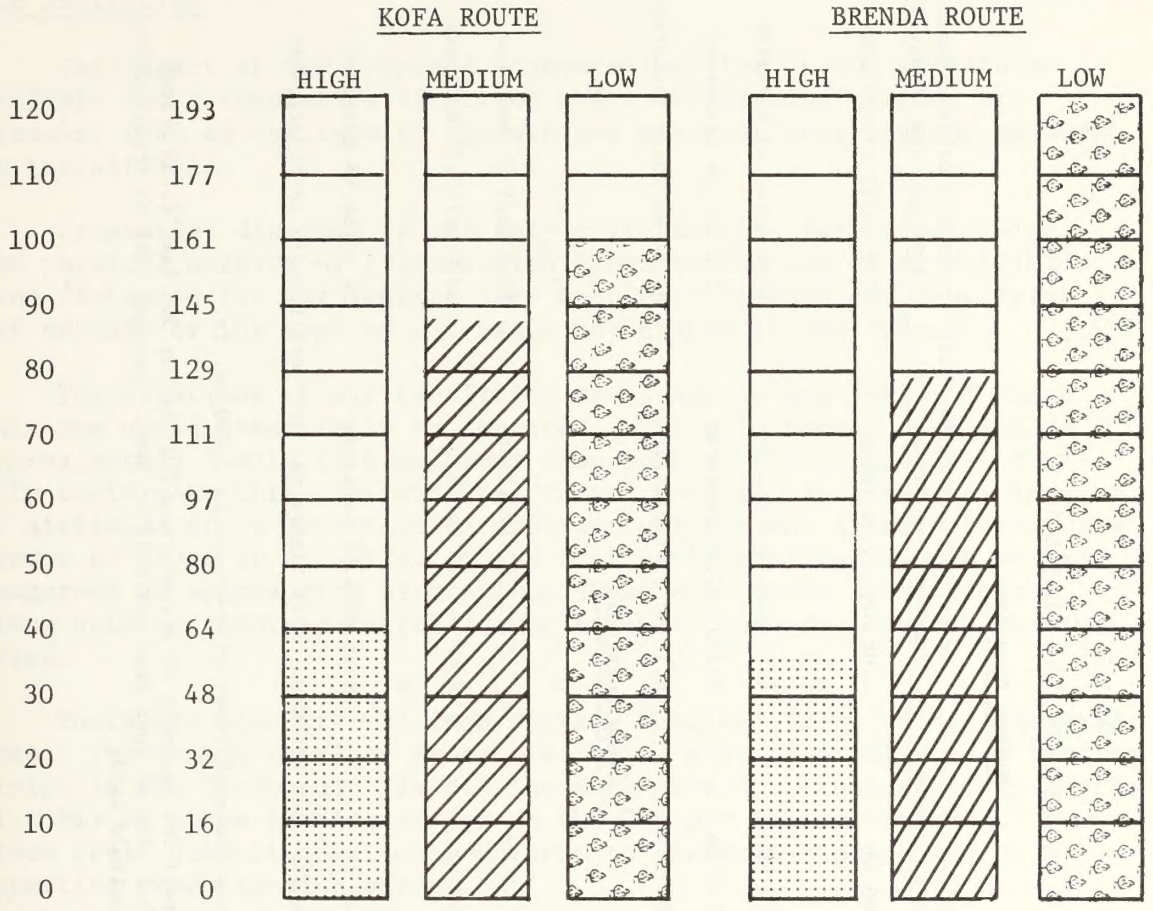
Lesser impacts on agricultural areas would be removal of land from production and interference with farming activities during construction and maintenance. According to the applicant, roads constructed through agricultural lands would be temporary and the disturbed farmland could be returned to production. Refer to table 3-5 for acres of land (permanent and temporary) impacted by each corridor.

Other agricultural land use impacts involve the use of wide angle sprinkler irrigation systems. Such sprinklers may not be totally efficient within range of the towers. Flood irrigation will not be affected. This impact will generally be low since flood irrigation is predominantly used in the study area.

Livestock Grazing

Loss of vegetation to access roads, tower sites, storage yards, and conductor/wire stringing sites would reduce total available livestock forage, but would have no real effect on existing grazing programs. Given the small number of AUM's that would be lost, the impact on livestock grazing would be considered minimal. Secondary impacts on existing livestock operations would result from crossing range fences and livestock watering locations; however, these impacts would be negligible. The towers will provide some shade to livestock.

RECREATION IMPACT SUMMARY



Source: BLM Team

Figure 3-5.

TABLE 3-5

AGRICULTURAL LAND DISTURBED

BRENDA CORRIDOR

Location	[1] No. of Miles/ Kilometers Traversed	[2] Acres/Hectares Permanently Removed from Production	[3] Acres/Hectares Temporarily Removed from Production
Harquahala Plain	11 mi/17.69 km	2.08 ac/.84 hectares	42.6 ac/17.25 hectares
Tonopah Desert	0	0	0
Palo Verde Valley	10 mi/16.09 km	1.89 ac/.76 hectares	39.0 ac/15.79 hectares
Coachella Valley	.75 mi/1.2 km	0.143 ac/.05 hectares	2.2 ac/.89 hectares
TOTALS	21.75 mi/34.99 km	4.11 ac/1.66 hectares	83.80 ac/15.79 hectares

KOFA CORRIDOR

Harquahala Plain	0	0	0
Tonopah Desert	4.0 mi/6.43 km	.76 ac/.30 hectares	15.0 ac/6.07 hectares
Palo Verde Valley	10 mi/16.09 km	1.89 ac/.76 hectares	39.0 ac/15.79 hectares
Coachella Valley	0	0	0
TOTALS	14 mi/22.52 km	2.65 ac/1.07 hectares	54 ac/86.88 hectares

[1] Miles based on centerlines depicted on the Land Use Map. This figure may decrease (2-mile corridor) when the line is constructed.

[2] Assumes 3.3 freestanding towers per mile and each tower site occupying 2,500 sq. ft.

[3] Assumes 200 feet by 200 feet (0.92 acres) for assembly of structures, 200 feet by 300 feet (1.38 acres) for pulling sites every 3 miles, and 0.2 mile of spur road per mile of line. Assumes that no construction yards or batch plants will be on agriculture land.

Source: BLM Team

Air Facilities

The impact of the proposed transmission line on any particular airfield has a cumulative effect on whatever existing hazards are present, such as the type of terrain and man-made obstructions adjacent to the airfield.

Presently, distance is the only criteria used for ascertaining the physical hazards of transmission lines to the use of an airfield. Long distances for the impacts have been used because air facilities may expand, or the type of air usage may change in the future.

The locations of air facilities are shown on map 2-4. Of these only one would potentially be impacted. Shaver's Summit Airfield is approximately 1 mile (1.6 km) away from both corridors and its proximity could make this airfield hazardous. However, in assessing impacts on airfields it is important to consider whether the lines parallel the runway or cross at an angle. Lines that parallel a runway are not as dangerous to approaching aircraft as those that cross at an angle. Since both corridors parallel Shaver's Summit runway, impacts are minimized.

There are also several crop dusting landing strips within the study area. The Brenda corridor crosses within 1 mile (1.6 km) of six landing strips in the Harquahala Plain. The Kofa corridor crosses within 1 mile (1.6 km) of three landing strips in the Tonopah Desert vicinity. Powerlines could present additional hazards to aircraft approaching or departing these landing strips.

Communication Sites

There would be no significant impact on land uses as a result of proposed communication sites because the sites already have existing facilities and access roads.

LINEAL LAND USES

Roads

There will be a permanent visual impact when the transmission line transects existing road systems. A temporary impact will also occur as a result of traffic disruption at corridor and major highway crossings during construction. The Kofa Route makes ten major highway crossings and the Brenda Route makes five major highway crossings.

Railroads

There will be no anticipated impacts to railroads within the study area as indicated by representatives from Kaiser Steel Corporation and Atchison, Topeka and Santa Fe Railroad.

Utilities

State and Federal regulations would require the applicant to adhere to minimum standards established by the National Electric Safety Code (NESC) and General Order 95. These standards will essentially eliminate all adverse impacts to existing utilities.

Pipelines

Heavy equipment could damage the existing gas lines at road crossings. Both routes cross these gas lines several times. The number of crossings and locations are presently unavailable until centerline is fixed. These gas lines are buried approximately 3.5 feet (1.1 m). EPG has informed BLM that at least 5 feet (1.5 m) of soil cover are needed to adequately protect these lines from damage by heavy equipment.

There could also be an impact from electromagnetic buildup on the pipelines. EPG is currently conducting studies to determine potential hazards of electromagnetic interference of high voltage transmission lines on pipelines.

Land Use Plans and Constraints

The proposed transmission line does not conflict with any local, State, or Federal land use plans or zoning.

WILDERNESS AREAS

Wilderness impacts in California as depicted by this study differ from those shown in the Sundesert Final Environmental Statement. The Sundesert study discussed only direct impacts to the Proposed Wilderness Study Areas. Organic Act Directive No. 79-3, issued after the final Sundesert ES went to print, requires that wilderness impacts be discussed on the basis of (1) Primary or "those within a Wilderness Study Area (WSA), and (2) Secondary or "those outside, but adjacent to the WSA's." Also, the Sundesert treated the wilderness impacts as an integral part of the recreation impacts and not as a separate consideration.

Direct (or primary) impacts to the concept of wilderness within the Proposed Wilderness Study Areas (PWSAs) identified will be the physical presence of the construction access roads, maintenance spur roads, and the transmission line itself. Indirect (or secondary) impacts will occur as visual intrusions to PWSAs.

Granting of a transmission right-of-way and associated construction activities within a PWSA could seriously impair its suitability for preservation as wilderness. This would depend on the size of the area and the location of the transmission line and its appurtenances. Section 603 (c) of the Federal Land Policy and Management Act of 1976 directs that these areas (wilderness study areas) shall be managed in a manner "so as not to impair the suitability of such areas for preservation as wilderness," and further, the Secretary of the Interior shall "take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection."

IMPACT CRITERIA

Primary

High impacts are considered to be the direct impacts which occur where the proposed transmission line would physically cross a proposed wilderness study area, reducing that area, but not necessarily eliminating the PWSA from consideration as a study area.

Secondary

Medium impacts are considered to be the indirect or visual impacts caused by the presence of the proposed transmission line adjacent to a PWSA where no other visual intrusion presently exists. The visual contrast rating of the proposed line would be 10 or greater for any one landscape feature (BLM Manual 8400).

Low impacts are considered to be indirect or visual impacts caused by the presence of the proposed transmission line adjacent to a PWSA where other visual intrusions presently exist. The visual contrast rating of the proposed line would be 9 or less.

IMPACT IDENTIFICATION

Impacts on PWSAs identified in chapter 2 are portrayed on map 3-7.

The impacts of the alternate routes are identified for a 2-mile corridor and are discussed below by state, route and degree of impact. PWSAs are delineated on map 2-12.

Brenda Corridor, Arizona

High Impacts

High impacts are anticipated in the south portion of the corridor as it crosses into the Eagletail Mountains, PWSA #2.

Medium Impacts

Medium impacts were identified in the north portion of the Brenda corridor as it passes adjacent to the Eagletail Mountains, PWSA #2.

Low Impacts

Low impacts were identified in the corridor as it passes adjacent to the following PWSAs:

Saddle Mountain, PWSA #1
Eagletail Mountains, PWSA #2

Brenda Corridor, California

High, medium and low impacts are anticipated for each of the PWSAs which have been identified and are located south of I-10 in California. This includes:

Mule Mountains, PWSA #5
Little Chuckwalla Mountains, PWSA #6
Chuckwalla Mountains, PWSA #8
Orocopia Mountains, PWSA #10
Mecca Hills, PWSA #11

Kofa Corridor, Arizona

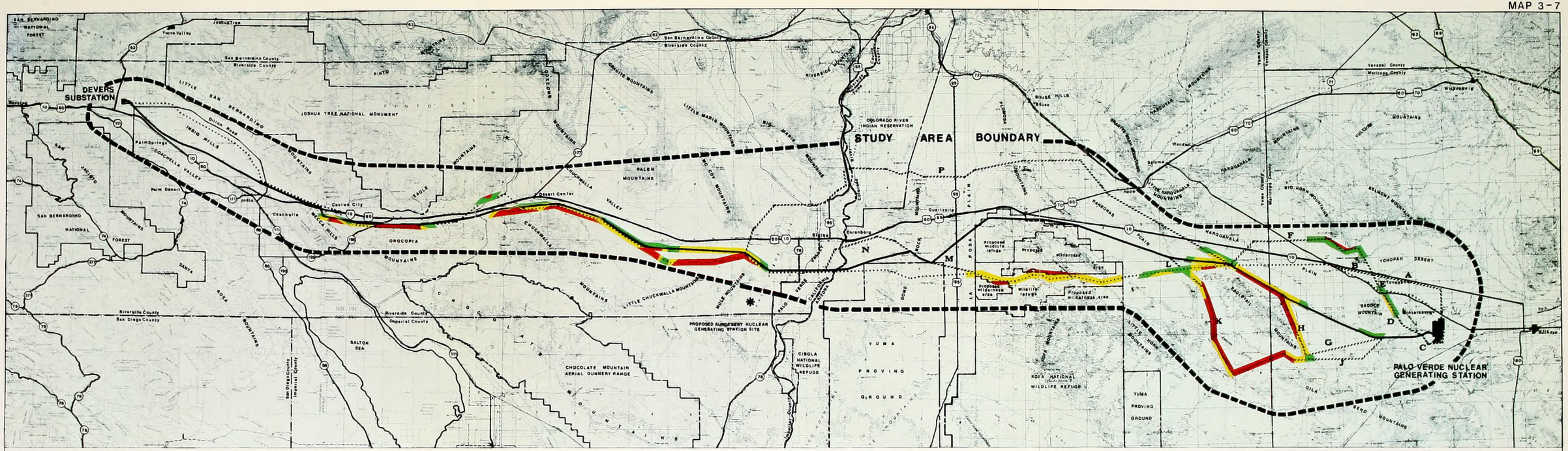
High Impacts

High impacts are anticipated in the south half of the Kofa corridor in the area of the Eagletail Mountains (PWSA #2) along the existing pipeline route.

High impacts are anticipated in portions of the corridor through the Kofa National Wildlife Refuge.

Medium Impacts

Medium impacts were identified where the Kofa corridor passes adjacent to the northeast side of Saddle Mountain (PWSA #1).



N

0 5 10 20 MILES

0 10 20 KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES .....

A

LEGEND

- HIGH
- MEDIUM
- LOW
- NONE

SOURCE: BLM TEAM

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WILDERNESS IMPACTS

Medium impacts are also anticipated in the north half of the Kofa corridor in the area adjacent to the Eagletail Mountains (PWSA #2) along the existing pipeline route.

Medium impacts are also identified north of the Little Horn Mountain, PWSA #3, and through the Kofa National Wildlife Refuge.

Low Impacts

Low impacts are anticipated where the proposed line passes adjacent to the following PWSAs:

Saddle Mountain, PWSA #1
Eagletail Mountains, PWSA #2
Little Horn Mountains, PWSA #3

Kofa Corridor, California

High, medium and low impacts are anticipated for each of the PWSAs which have been identified in the California portion of the study area, with the exception of the Palen-McCoy Mountains, PWSA #7. This includes:

Mule Mountains, PWSA #5
Little Chuckwalla Mountains, PWSA #6
Chuckwalla Mountains, PWSA #8
Eagle Mountains, PWSA #9
Orocopia Mountains, PWSA #10
Mecca Hills, PWSA #11

No routing was identified within the Kofa corridor which could bypass the Mule Mountains, PWSA #5.

VISUAL RESOURCE MANAGEMENT (VRM)

Impacts to visual resources are by their nature highly controversial and difficult to measure. Some persons are highly sensitive to any visual intrusion while others are less sensitive. To some a powerline or any engineered development is an example of man's achievement, and therefore, pleasing. Many people are so used to seeing powerlines today that such developments go completely unnoticed.

Impact Criteria

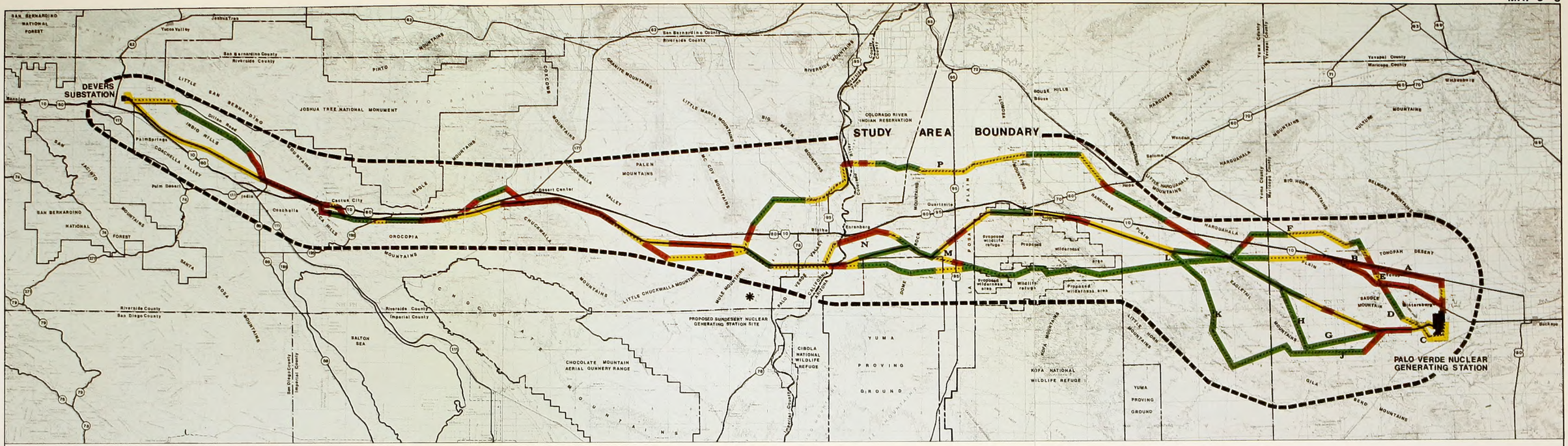
Visual impacts as portrayed on map 3-8, were identified using the BLMs VRM system (BLM Manual 6300). Visual contrast ratings (CR) were assigned to the proposed powerline and it's associated construction roads and communication sites at various points along the major travel routes and at viewpoints along the alternative routes. The details of this process and respective results are available in Yuma and Riverside District Offices, BLM. The discussion of these impacts is broken down by alternative routes and degree of impacts.

IMPACTS

Visual impacts created by the powerline will exist during construction as dust, marshaling yards, and heavy equipment working as well as towers and lines in various stages of completion. These impacts will be temporary except that construction scars will tend to exist for longer periods.

Long-term impacts will include essentially the visual intrusion of towers and lines, construction and maintenance roads and communication sites. The substation at Devers already exists and the PVNGS has been treated in an impact statement. Distance will have a direct influence on impacts. The greater the distance from the observation point, the less will be the visual impacts. For example, a 200-foot (61 m) tower viewed from 3 miles (4.8 km) away will appear to be about 25 feet (7.6 m) tall compared to the same tower viewed from three-tenths (.5 km) of a mile away. See figure 3-6, for relative heights. Tower spacing will also affect visual impact.

Construction and maintenance roads would also constitute a visual intrusion. However, this will only occur when they are viewed from a height or when the roads parallel the line of sight. In most instances time, vegetation and topography will obscure them.



N

0 5 10 20 MILES

0 10 20 KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES /////////////////

A

LEGEND

- HIGH (CONTRAST SCORE 21-30)
- MEDIUM (CONTRAST SCORE 11-20)
- LOW (CONTRAST SCORE 1-10)

SOURCE: BLM TEAM

UNITED STATES

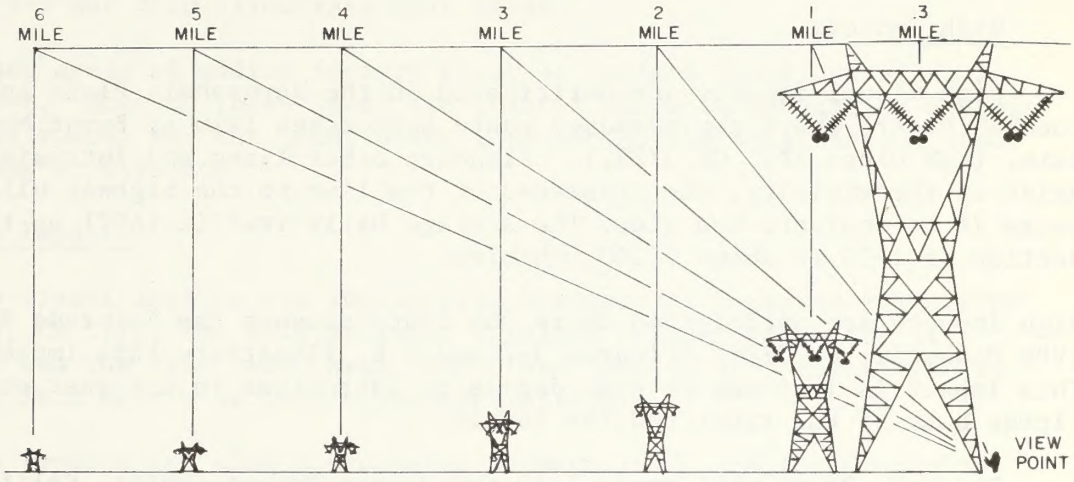
DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

VISUAL IMPACTS

VISUAL IMPACTS AT VARIOUS DISTANCES



NOTE: .3 MILE IS USED FOR THE DISTANCE TO THE FIRST TOWER, AS THIS IS THE PROPOSED TYPICAL TOWER SPACING.

THE EXAMPLE ILLUSTRATES RELATIVE HEIGHT COMPARISONS AND DOES NOT TAKE THE EARTHS CURVATURE INTO ACCOUNT. THE APPARENT HEIGHTS OF TOWERS BEYOND TWO MILES WOULD BE SIGNIFICANTLY SMALLER THAN THE EXAMPLE, DUE TO THE EARTHS CURVATURE.

Source: BLM Team

Figure 3-6.

Visual impacts will be greater when the powerline either parallels or crosses main travel routes. In some instances proposed locations will interrupt a scenic view of one of the several picturesque mountain ranges.

The impacts of the alternate routes are discussed by route and degree of impact.

Kofa

High Impacts

High visual impacts are anticipated on the Harquahala Plain and Tonopah Desert where the proposed route approaches I-10 at Burnt Mountain. (VRM Class III, CR 3/23.) Although other lines and intrusions exist in the vicinity, the closeness of the line to the highway will cause it to dominate the view. The Average Daily Traffic (ADT) on this section of I-10 is about 7,100 vehicles.

High impacts are anticipated where the route crosses the Colorado River (VRM Class II, CR 3/35) (figures 3-7 and 3-8, illustrate this impact). This impact is lessened to some degree by intrusions to the west and the riprap bank of the river and the levees.

The Kofa Route will cross I-10 twice near Desert Center, California, and east of Cactus, California (7,000 vehicles ADT). These crossings will result in high visual impacts although travelers will see them only briefly.

High visual impacts will also occur when the route crosses Wiley Well Road and parallels the south side of the Interstate crossing in front of Little Chuckwalla Mountain, the Chuckwalla Mountains and the west end of the Orocopia Mountains. The line would also parallel the north side of the Interstate for a short distance west of Cactus, California, interfering with the view of the Little San Bernardino Mountains.

Medium Impacts

Because of existing intrusions on parts of the Harquahala Plain (VRM Class III CR 2/16), Palo Verde Valley, California (VRM Class IV, CR 2/16), and the North Palm Springs area, high visual impacts are not anticipated. Medium impacts will occur since the proposed 500 kV lines will be significantly larger than existing lines and will contrast accordingly.

The route crosses Highway 95 about 10 miles (16 km) south of Quartzsite, Arizona (700 vehicles ADT) (VRM Class III, CR 2/20). The impact of the crossing is lessened somewhat by the vegetation east of the highway and because it crosses at right angles. It will be visible by travelers for only a short time.

Since many intrusions exist in the Palo Verde Valley, it is anticipated a medium visual impact will result when the route crosses California State Highway 78 (1,100 vehicles ADT) (VRM Class IV, CR 2/20). Figures 3-9 and 3-10 illustrate this impact.

Other areas of medium impacts occur at various locations as shown on map 3-8. Most of these areas are located close to population centers or travel zones, and the impacts are lessened by the existence of other intrusions or distance.

Low Impacts

Low visual impacts are anticipated through the Ranegras Plain (VRM Class IV, CR 1/7), the Kofa National Wildlife Refuge (VRM Class II, CR 1/7), and the Palo Verde Mesa (VRM Class III, CR 1/9) mostly due to distance from main view points and populations.

Low impacts are also anticipated between I-10, and the Orocopia Mountains and the Mecca Hills.

Existing visual intrusions and sparce population account for the lower anticipated visual impacts of this route in the area north of the Indio Hills.

Brenda

High Impacts

Although the incidence of travel is low south of Saddle Mountain (less than 20 vehicles ADT) (VRM Class III, CR 3/26), high visual impacts are anticipated where the proposed route parallels the south access road to the Harquahalla Valley, and where the route crosses the main paved access through the valley (VRM Class III, CR 3/23).

High visual impacts are anticipated as this route parallels I-10 just east of its junction with U.S. 60/70 (VRM Class III, CR 3/25). This location will interrupt the highly scenic areas south of the highway.

High impacts are also anticipated as the route crosses the south road within the La Posa recreation site (VRM Class II, CR 3/25)

Figure 3-7. Colorado River Crossing without Palo Verde-Devers Transmission Line. Brenda Route milepost 102.8 to 105.8, Kofa Route milepost 100.2 to 103.2 (see map 1-1).

Figure 3-8. Colorado River Crossing with Palo Verde-Devers Transmission Line. Brenda Route milepost 102.8 to 105.8, Kofa Route milepost 100.2 to 103.2 (see map 1-1).

Figure 3-9 California Highway 78 Crossing without Palo Verde-Devers Transmission Line. Brenda Route milepost 111.5, Kofa Route milepost 109.5 (see map 1-1).

Figure 3-10. California Highway 78 Crossing with Palo Verde-Devers Transmission Line. Brenda Route milepost 111.5, Kofa Route milepost 109.5 (see map 1-1).

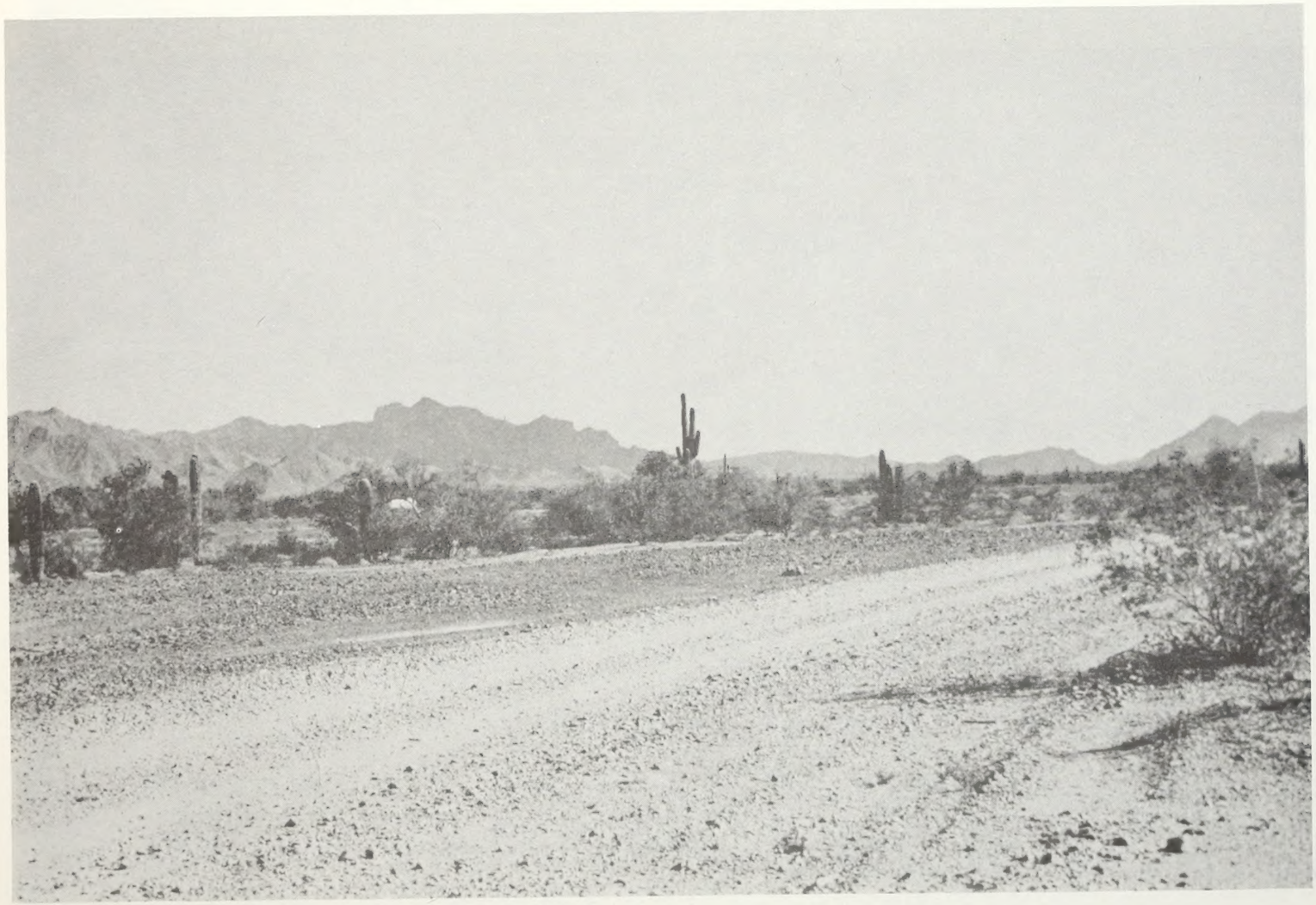


Figure 3-11. La Posa Recreation Site without Palo Verde-Devers Transmission Line. Brenda Route milepost 84.5 (see map 1-1).

Figure 3-12. La Posa Recreation Site with Palo Verde-Devers Transmission Line. Brenda Route milepost 84.5 (see map 1-1).

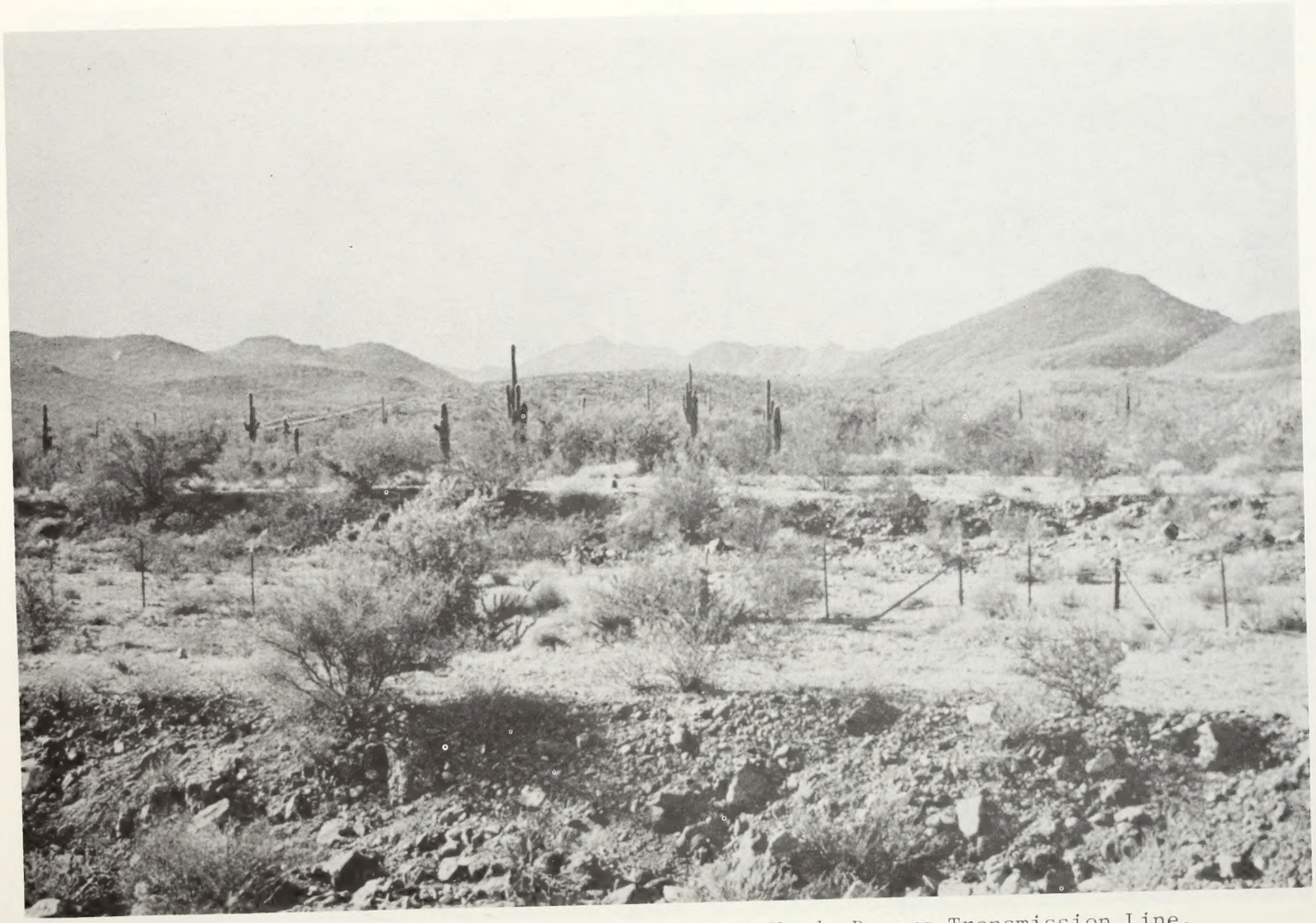


Figure 3-13. Plomosa Mountains without Palo Verde-Devers Transmission Line. Brenda Route milepost 73.8 to 75.2 (see map 1-1).

Figure 3-14. Plomosa Mountains with Palo Verde-Devers Transmission Line. Brenda Route milepost 73.8 to 75.2 (see map 1-1).

(figures 3-11 and 3-12) and Arizona State Highway 95 (VRM Class III, CR 3/26), the Colorado River (VRM Class II, CR 3/25), California State Highway 78 (VRM Class IV, CR 3/23), Wiley Well Road, and I-10 just west of Cactus City, California. At highway crossings, the impact to passing motorists will be of short duration.

As with the Kofa Route, high impacts will occur where the route parallels I-10 just north of the Chuckwalla Mountains, the west portion of the Orocopia Mountains, and just north of the Interstate west of Cactus City, California.

Medium Impacts

Medium impacts will occur as the route leaves the PVNGS west and along portions of the route in the agricultural land of the Harquahala Valley (VRM Class III, CR 2/16), and in the Ranegras Plain (VRM Class III, CR 2/16).

Because of the nature of the vegetation and the route's distance from main camping areas, the route through the north portion of the La Posa site is not anticipated to have as high a visual impact as through the south portion of the site (VRM Class II, CR 2/16).

Medium impacts are also anticipated through portions of the Palo Verde Valley, California (VRM Class IV, CR 2/16); the Chuckwalla Valley, California; between the Chuckwalla and Orocopia Mountains and south of the Indio Hills.

Low Impacts

Because of the distance from populous areas and main travel routes, low impacts will occur in portions of the Harquahala Valley (VRM Class III, CR 2/10), Ranegras Plain (VRM Class III, CR 2/10), the Dome Rock Mountains in Arizona (VRM Class IV, CR 1/7); impacts will also be low in the Palo Verde Mesa (VRM Class III, CR 1/9), and between Chiriaco Summit and Cactus City, California.

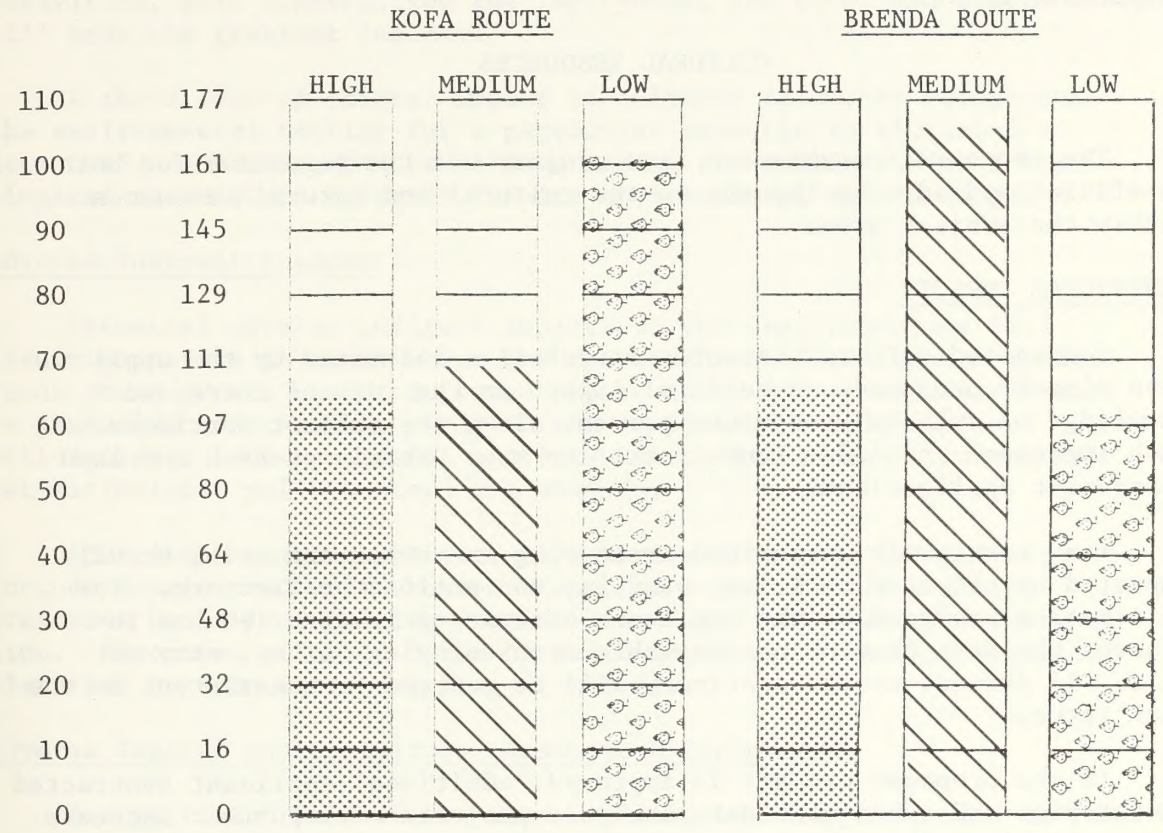
Low visual impacts (figures 3-13 and 3-14) are calculated for the area along I-10 through the Plomosa Mountains in Arizona (VRM Class II, CR 1/9). The reason for this is that natural terrain will obscure the view. Travelers will only catch brief glimpses of the powerline.

A summary of the various impacts identified are shown on figure 3-15.

Communications Sites

The new communications facilities on Electronic Hill (VRM Class III CR 1/9) and in the Chuckwalla Mountains will generally go unnoticed except by those with knowledge of them and their locations.

VISUAL IMPACT SUMMARY



Source: BLM Team

Figure 3-15

The impact on the Chuckwalla Mountains site will be less than on the Electronic Hill site because of the greater distance from main travel routes. Impact ratings will probably be low and medium for the respective sites.

CULTURAL RESOURCES

The proposed transmission line project has the potential for both beneficial and adverse impacts to the cultural and natural resources within the subject area.

BENEFICIAL IMPACTS

Contracted cultural resource inventories initiated by the applicant have already produced a beneficial impact in the form of increased knowledge on cultural resources present along the subject corridors. Such increased knowledge lends itself to many useful research and land management applications.

Many previously unrecorded archaeological sites are being heavily impacted by off-road vehicles, vandals, and artifact collectors. The information produced by the applicant contracted inventories has increased the data base on nonrenewable archaeological sites, many of which, if present trends continue, will be reduced to nonexistent in the near future.

If the proposed project is approved, additional applicant contracted inventories and subsequent data analysis projects will further increase the available cultural resource data for the study area.

ADVERSE IMPACTS

Cultural resources within the study area are characteristically surface manifestations with little or no stratigraphic depth. Consequently, physical disturbance of ground surface would alter or destroy those cultural resources present.

Adverse Direct Impacts

Primary direct adverse impacts to cultural resources would occur during ground disturbing activities associated with construction of the project. Additional direct impacts might occur during the operation and maintenance stage and in the event of abandonment. Cultural resource impacts would be directly proportional to the amount of new ground surface disturbance occurring.

Ground surface disturbances which would impact cultural resources are new road building, widening and improving existing roads, construction of tower pads, pulling stations, construction yards, batch plants, communication sites and expansion of the Devers Substation. Of these activities, road construction and improvement and tower pad construction will have the greatest impacts.

A third type of adverse impact to cultural resources occurs when the environmental setting for a particular resource is disturbed or destroyed. A primary factor in determining the quality of an archaeological site is the integrity of its environmental surroundings.

Adverse Indirect Impacts

Potential adverse indirect impacts to cultural resources will result primarily in areas where the construction of additional access roads would permit new or improved public entry into previously remote or generally inaccessible parts of the study area. Such improved access will increase both purposeful and inadvertent damage to resources by recreationists, relic hunters and vandals.

Additional ongoing indirect impact resulting from the project may include accelerated soil erosion (resource erosion) or deposition (resource burial), resulting from new road cuts and tower pad construction. Resources situated directly under a transmission line might be disturbed by rain water dripping from lines.

Adverse Impacts to the Cultural Resource Environment

A significant part of the data-yielding capacity of a site is the original site environment, which often holds the key to understanding how aboriginal peoples were able to subsist. Changes to site environment resulting from construction or from indirect impacts, can result in a serious loss of scientific and humanistic information.

Adverse Impacts to National and State Register Properties

Currently there are 14 areas within the study area which are either on a National or State Register, or are being considered for eligibility. Another 12 areas have been declared candidates for eligibility determinations or are known to be potential candidates for a National or State Register list. Of these, one (Winter's Wash Archaeological District) is crossed by the Brenda-Kofa corridors and would receive direct impacts. Another eight sites and/or districts are relatively close to the corridors and would at least be exposed to increased indirect impacts. The remaining sites/districts are some distance from the proposed corridors.

The actual impact of the proposed project on these properties cannot be determined until locations of the corridor centerline and associated roads and tower sites are finalized.

Adverse Impacts to Paleontological Resources

From the extremely limited available data on paleontological resources in the study area, it is known only that there are several areas which may contain fossilized remains. Those areas which may contain paleontologically sensitive areas are incorporated into the Archaeological Sensitivity Map 2-15 and table 2-16. Only after more paleontologic field investigation will an estimate of potential impacts to this resource be possible.

Adverse Impacts of Cultural Resource Excavation or Collection

Should the proposed project be authorized, it is probable that some impacts to cultural resources will be mitigated by professional collection and excavation. Mitigation of impacts by collection or excavation causes a direct resource impact. Since more advanced techniques for future investigation and data gathering may be developed it is preferable that the resource remain in place. However, where site areas are unavoidable, the adverse impacts of total loss far outweigh those resulting from current data recovery techniques.

Possible Adverse Impacts to Native American Values

A potentially sensitive historic dimension of the study area concerns areas which may hold historic, religious or other cultural values of significance to Native American groups. Recently California has passed a law (Public Resources Code 5097.9-5079.97, July 1, 1977) which requires identification and protection of such values.

IMPACTS SUMMARY

Any disturbance to an archaeological site or its environmental setting can be serious. Intra-site proximity patterns and material distributional arrangements are extremely fragile, especially within the surface sites common to the study area.

The actual degree of impact any one particular site may receive from direct or indirect impacts will greatly depend on the placement of tower sites and new access roads. The intensity of surface disturbance

(all types) relative to the location of archaeological and historical values would determine the degree of impact, which might range from little or no significance to total destruction of such resource values.

Until such time as the actual location of various surface disturbing construction activities can be correlated with the site-specific location of cultural resources, the final degree of impact to these resources can only be estimated. For the meantime, table 3-6 and map 3-9 summarize currently projected potential direct and indirect impacts to cultural resources according to ratings of high (major or severe resource impacts), medium (moderate resource impacts), low (limited resource impacts), and none (no resources present or no impacts anticipated). Projected cultural resource impacts are not always equal to cultural resource sensitivity (as depicted in table 2-16 and map 2-15). Various environmental factors (such as current access roads or natural resource protection, etc.) cause the potential for resource impact to be either higher or lower than the projected resource sensitivity.

SOCIOECONOMIC CONDITIONS

The short-term consequences of construction would be felt by communities in Maricopa, Yuma, and Riverside Counties during the 2 years of the scheduled construction phase, 1980 and 1981. Impacts on areas in or adjacent to the transmission line corridor would result from the operation of the line during the applicant-requested lease period, 1982 to 2032. Although the right-of-way would be leased for a limited period (50 years), the applicant is asking for the right of renewal in its application to BLM.

Short-term impacts would stem from material purchases and hiring by SCE and its contractors, and expenditures of employees. These impacts would occur in Maricopa, Yuma, and Riverside Counties, and to a lesser degree, in communitites where materials originate. Given the small size of the applicant's project relative to large regions that would absorb the project's impact, most communities within the ES region would not be significantly affected. Exceptions are discussed below.

Long-term impacts would be caused by the physical presence of the transmission line and its operation. The significance of these impacts would depend on the extent to which the powerline would: (1) constitute an intrusion upon nearby communities and detract from the residents' quality of life, and (2) increase the property tax base and consequently public revenues. Both of these impacts would be felt in areas adjacent to the transmission line. Maricopa, Yuma, and Riverside Counties, as a whole, would not be significantly affected.

TABLE 3-6

SUMMARY OF PROJECTED CULTURAL RESOURCE IMPACTS
PER 10 MILE UNITS (OR PORTIONS THEREOF)
(From Palo Verde Plant and West)

H = High M = Medium L = Low N = None

A. BRENDA ROUTE

10-Mile Unit	Portion of 10-Mile Unit	Probable Direct Impacts	Probable Indirect Impacts	Summary of Impacts
0 - 10	0 - 2.5	Plantsite		
	2.5- 5	H	H	H
	5 - 7	L	L	L
	7 - 10	H	H	H
10 - 20	10 - 16	M	M	M
	16 - 20	N	N	N
20 - 30	20 - 25	N	N	N
	25 - 30	L	L	L
30 - 40		M	L	M
40 - 50		L	L	L
50 - 60	50 - 55	L	L	L
	55 - 58.5	M	L	M
	58.5- 60	L	H	H
60 - 70		M	M	M
70 - 80		M	M	M
80 - 90	80 - 83	M	M	M
	83 - 86	H	M	H
	86 - 89	L	L	L
	89 - 90	M	M	M
90 -100	90 - 91	M	M	M
	91 - 93	H	M	H
	93 -100	H	H	H
100 -110	100 -107	H	H	H
	107 -110	N	N	N
110 -120	110 -116	N	N	N
	116 -120	M	M	M
120 -130		L	L	L
130 -140		L	L	L
140 -150		L	L	L

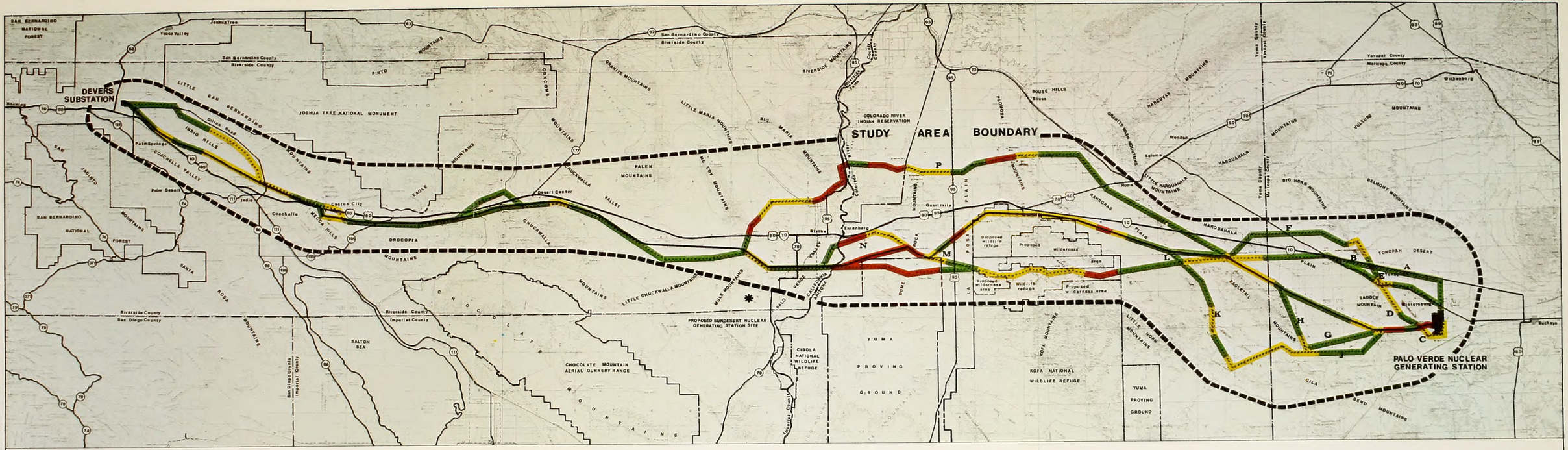
TABLE 3-6 (Cont'd)

10-Mile Unit	Portion of 10-Mile Unit	Probable Direct Impacts	Probable Indirect Impacts	Summary of Impacts
150 -160	150 -153	L	L	L
	153 -156	M	L	M
	156 -160	L	L	L
160 -170		L	L	L
170 -180		L	L	L
180 -190		L	L	L
190 -200	190 -194	M	M	M
	194 -200	L	L	L
200 -210	200 -205	L	M	M
	205 -210	M	L	M
210 -220	210 -217	M	L	M
	218 -220	L	L	L
220 -230	220 -225.5	L	L	L
	222.5-230	M	L	M
230 to Devers		L	L	L
B. KOFA ROUTE				
0 - 10		L	L	L
10 - 20	10 - 13	M	L	M
	13 - 15	L	L	L
	15 - 20	N	N	N
20 - 30	20 - 25	N	N	N
	25 - 30	L	L	L
30 - 40	30 - 33	L	L	L
	33 - 40	M	M	M
40 - 50	40 - 46	M	L	M
	46 - 50	L	L	L
50 - 60	50 - 57	L	L	L
	57 - 60	H	H	H
60 - 70	60 - 62	H	H	H
	62 - 70	M	L	M
70 - 80	70 - 74	M	L	M
	74 - 78	H	L	H
	78 - 80	M	L	M
80 - 90	80 - 86	L	L	L
	86 - 88	M	H	H
90 -101		H	H	H
101 -117.5		Same as Brenda Route		
117.5-120		L	L	L
120 -130		L	L	L

TABLE 3-6 (Cont'd)

10-Mile Unit	Portion of 10-Mile Unit	Probable Direct Impacts	Probable Indirect Impacts	Summary of Impacts
130 -135.5		L	L	L
139.5-157		Same as Brenda Route		
157 -160		L	L	L
160 -170		L	L	L
170 -190		Same as Brenda Route		
190 -197.5		M	L	M
197.5-207		Same as Brenda Route		
207 -210		M	L	M
210 -220		M	L	M
220 -230		L	L	L
230 -Devers		L	L	L
Devers Substation Expansion		L	L	L
Electronic Hill Communication Station		L	L	L
Chuckwalla Communication Site		L	L	L

Source: BLM Team



N

0 5 10 20
MILES

0 10 20
KILOMETERS

ROUTES UNDER STUDY

BRENDA ——————

KOFA .....

SUBALTERNATES /////////

A

LEGEND

HIGH

MEDIUM

LOW

SOURCE: BLM TEAM

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

CULTURAL RESOURCE IMPACTS

The following analysis distinguishes the social and economic impacts of the Palo Verde-Devers transmission line by causation, duration, and extent. The focus of the analysis of the short-term impacts (the impacts from the construction of the line in 1980 and 1981) is on Maricopa, Yuma, and Riverside Counties. Permanent impact assessment is focused on those communities that, all or in part, are located within 2 and 5 miles (3.2 and 8 km) of the routes. The projected construction phase would principally affect community populations, and community economics; operation would primarily impact perceived and objective quality of life.

Impacts from either route would be substantially the same. Significant differences are specifically addressed.

DEMOGRAPHIC FEATURES

In the short-term, the proposed transmission line would generally have temporary and insignificant impacts upon populations in the region of study. Projected operation of the line would not entail any new hiring by the applicant, or create new jobs indirectly. During the construction period (1980-1981), as many as 354 workers will be employed. Recent studies suggest that the regional pool of skilled labor in the building trades is more than sufficient to supply the needs of the applicant and its contractors (Williams Brothers, 1976).

The project might cause temporary migration within the region. Some workers from more populous areas would probably move to communities closer to work sites. However, it is anticipated that the majority would commute on a daily or weekly basis. Three factors would minimize the extent of such movement. First is the temporary nature of employment. Secondly, progressive movement of work sites will discourage employees from settling in any one community and finally, more than half of the length of both alternative routes is within 1-1/2-hours driving time from either Phoenix, Arizona, or Riverside, California.

Workers could commute from homes in eastern and central Maricopa County to portions of the route between the PVNGS and a point near the western edge of the Harquahala Valley. In California, workers could commute from homes in western and central Riverside County to portions of the route between the Devers Substation and a point between Blythe and Desert Center.

Some employees residing in Riverside or nearby towns might move to communities in Coachella Valley to be closer to work sites along the western segments of the transmission line. The work force employed along this segment would probably include some persons who already live in the area between Coachella and Desert Hot Springs, California.

But even if all workers on the line west of Desert Center took temporary accommodations in Indio, Palm Springs, and other towns in the Coachella Valley, they would add only 0.2 percent to the valley's population. Table 3-7 compares these possible migrants to central Riverside County with the projected number of inhabitants living in the Coachella Valley in 1980. These temporary inhabitants would not strain the supply of transient units.

The central section of the transmission line, which would run roughly 50 miles (80.4 km) east and 40 miles (64.3 km) west of Blythe, California is beyond reasonable driving time from major population centers, where most construction workers would live. Few of those working on this segment of the line are expected to commute daily. Workers not already living in Blythe would either have to commute weekly, or relocate.

At approximately the same time that the proposed powerline would be built, SDG&E might be building its proposed Sundesert Nuclear Generating Station, just south of Blythe. This project will employ as many as 2,400 construction workers for up to 11 years (Sundesert Nuclear Information Office, 1975). Labor demand will greatly exceed supply. Consequently, it has been assumed that no skilled workers now residing in the Blythe area will be available to the Palo Verde-Devers line. Labor required to complete the project in the central portions of the transmission line corridor will have to commute or relocate in the Blythe area.

A large number of the applicant's employees and contractors working near Blythe would probably commute weekly. This commuting pattern is common to construction projects in western United States (Mountain West Research, 1975). During the Monday-to-Friday work week, commuters reside in campers along side highways, having little contact with and making few demands on nearby communities. For a worst-case analysis, it is assumed that none of the workers needed to build the central portions of the line would commute. Rather, it is assumed that all 172 workers would temporarily relocate, residing in hotels, motels, guest homes, and mobile home parks. The projection is that 20 percent, or 34 workers, would be accompanied by their families. With an average household size of 3.59 persons, 260 people would move into the vicinity of Blythe. As shown in table 3-7 temporary migrants would not exceed 2.0 percent of the projected 1980 population of Blythe, California. If these families were competing for accommodations with SDG&E's Sundesert work force, such competition would result in shortages of housing.

TABLE 3-7

MIGRATION AND POPULATION OF CONSTRUCTION WORK FORCE
ES REGION, 1980 - 1981

County/CCDs	Maximum Number of In-Migrants	Projected Population 1980	In-Migrants as Percent of Projected Population	Comments
MARICOPA				
Buckeye	0	8,000	0.0	Workers on eastern segments of line assumed to be already residents of Maricopa County.
YUMA				
Parker	0	22,600	0.0	Any in-migrants assumed to settle in Blythe.
RIVERSIDE				
Palo Verde (Blythe)	260	12,900	2.0	-
Chuckwalla	0	4,200	0.0	Any in-migrants assumed to settle in Blythe.
Coachella) Desert Hot Sprgs.) Palm Desert/ Cathedral City) Palm Springs) (Coachella Valley))	268	130,000	0.2	-

Sources: Harbridge House, Inc., from construction manpower and scheduling information from Southern California Edison Company.

ECONOMIC CONDITIONS

The construction of the proposed transmission line would not adversely affect the economies of most communities along the two alternative routes. All communities are capable of meeting short-term construction-phase demands for goods and services, and most could supply the necessary labor. Indeed, benefits should flow from construction-related employment and income, especially during seasonal ebbs in economic activity.

In the short-term, construction of the Palo Verde-Devers transmission line along either route would employ as many as 354 workers at one time, for periods of a few weeks to 16-1/2-months. Project expenditures of the applicant and its contractors would amount to $19,622,500 for labor and $34,427,500 for materials, mildly stimulating the three-county economy. Maximum number of jobs added by construction of the line would equal 0.05 percent of present employment.

Since the line will be built in segments, construction workers would be allocated in phases during the construction period. These phases would include the construction of roads and foundations, the erection of towers, and the stringing of conductor cables. The construction force, which would initially be divided for work on both ends of the line, would reach a peak of 354 workers in the first quarter of 1981.

This work force would not all reside in the same area. Table 3-8 shows where the work force would be located and the duration of stays. As can be seen, the only small community that would host a large number of construction workers would be Blythe.

This transient population on the whole would have a beneficial effect on Blythe. The projection of economic impacts indicates that Blythe could supply the short-term demand for the goods and services that the construction population would require. Assuming that workers without their families spend an average of $20 a day, and workers with their families spend approximately $34 a day, the maximum quarterly increase in taxable sales and other transactions in Blythe would equal just less than $300,000. In addition, since many visitors are attracted to the area during winter months and construction population would peak during the spring and continue throughout the summer, the short-term demand would slightly suppress seasonal fluctuations in the economy.

With the exception of Blythe and Palo Verde Valley, California, no significant impacts are to be expected from short-term construction-phase demand at either the western or the eastern end of the line. The communities there are large enough to easily absorb the demand.

TABLE 3-8

LOCATION AND DURATION OF CONSTRUCTION WORK FORCE
(By CCD Areas) 1980-1981

County/CCDs	Number of Workers	Duration of Employment
Buckeye CCD	39	07/80 - 09/80
	118	10/80 - 12/80
	145	01/81 - 03/81
	69	04/81 - 06/81
Parker CCD	0	0
Palo Verde CCD	39	07/80 - 09/80
	118	10/80 - 12/80
	177	01/80 - 03/81
	163	04/81 - 06/81
	145	07/81 - 12/81
Indio-Palm Springs CCD	32	01/81 - 03/81
	69	04/81 - 06/81
	145	07/81 - 12/81

Source: Applicant

By contrast, construction and operation of the proposed transmission line would adversely impact the agricultural economies of areas along both routes. The Brenda Route would cross 21.75 miles (35 km) of farmland, of which 11 miles (17.7 km) would be in Harquahala Valley, Arizona, 10 miles (16 km) would be in Palo Verde Valley, California, and 0.75 miles (1.2 km) would be in the Coachella Valley. A total of 4.11 acres (1.7 ha) would be permanently lost to production, and 83.8 acres (33.9 ha) would be temporarily disturbed by construction. Table 3-9 presents the estimated dollar impacts based on reported average gross income per acre for each county. The impacts of the Kofa Route would be less since it would cross only 14 miles (22.5 km) of farmland. Kofa Route impact on Palo Verde Valley, however, would be identical to Brenda Route impact.

If acreage temporarily disturbed is returned to production, secondary effects of the proposed transmission line would interfere with agriculture. The earlier discussion of land use noted the difficulties of crop dusting with high-voltage lines between fields, and the fears of farmers and aviators of electrical effects from the cables. The economic value of farmland crossed by the Palo Verde-Devers transmission line would be reduced to the extent that these effects were experienced, or were believed to be experienced. This impact is inestimable since it is determined by subjective perceptions. Landowners would receive some compensation in the form of purchase or lease of the right-of-way.

Residents of Harquahala and Tonopah Valleys, Arizona, appeared at a hearing of the Arizona Power Plant and Transmission Line Siting Committee on March 2, 1978. At that hearing these residents registered strong opposition to any transmission right-of-way approval that would include agricultural lands or private property. Transcript of that hearing is cited in the Bibliography and is on file in the Yuma District Office, BLM.

COMMUNITY INFRASTRUCTURE

There will be little or no permanent impacts on community infrastructure.

Operation-phase impacts of the proposal on community infrastructure would be minor, with the exception of the beneficial effects of the transmission line on property tax revenues in the three counties. The applicant has estimated that the transmission system would be valued at more than $100 million by the time it becomes operational in 1982. As a result, the line would increase significantly the assessed valuation of the areas along the line. Table 3-10 shows projected impacts to annual property tax revenues of State and local governments, both in increased assessed valuation and increased potential property tax

TABLE 3-9

FARM ACREAGE DISTURBED AND AGRICULTURAL PRODUCTION LOST
(by CCD Areas) 1980-2032

BRENDA ROUTE

County/Farm Production Area	Construction Phase, 1980-1982 Acres Disturbed	Construction Phase, 1980-1982 Annual Production Lost	Operation Phase, 1982-2032 Acres Disturbed	Operation Phase, 1982-2032 Annual Production Lost
Maricopa				
Harquahala Valley	42.6	15,855	2.08	755
Riverside				
Palo Verde Valley	39.0	14,516	1.89	704
Coachella Valley	2.2	820	0.14	52
TOTAL	83.8	31,291	4.11	1,531

KOFA ROUTE

Maricopa				
Tonopah Desert	15.0	5,583	0.76	283
Riverside				
Palo Verde Valley	39.0	14,516	1.89	702
TOTAL	54.0	20,099	2.65	985

Note: In 1977 dollars

Source: Derived from U.S. Department of Commerce, Bureau of the Census, 1974 Census of Agriculture, Volume I, State and County Data, Arizona (Washington, D.C., May 1977).

TABLE 3-10

IMPACTS ON ASSESSED VALUATION, TAX AND PROPERTY TAX REVENUES IN 1977 DOLLARS

Taxing Jurisdiction	Length of Line Miles	(km)	IMPACTS ON ASSESSED VALUATION: Valuation of Line ($000)[b]	1977 Total Valuation ($000)[c]	Percent Increase	LINE IMPACTS ON POTENTIAL TAX REVENUES: Tax Payments of Line ($000)	1977 Total Tax Revenues ($000)	Percent Increase
State of Arizona	104.6	168.2	13,220	6,655,382	0.2	212	104,486	0.2
Maricopa County	30.7	49.4	5,528	3,058,515	0.2	148	81,662	0.2
School Districts:								
Arlington Elementary	30.7	49.4	5,528	12,565	44.0	175	398	44.0
Buckeye Union High	30.7	49.4	5,528	34,640	16.0	161	1,011	15.9
Maricopa Community College	30.7	49.4	5,528	3,058,515	0.2	42	23,245	0.2
Special Districts:								
Central Arizona Water Conservation	30.7	49.4	5,528	3,058,515	0.2	2	918	0.2
Maricopa Flood Control	30.7	49.4	5,528	2,337,412	0.2	12	4,675	0.3
Yuma County	73.9	119.1	7,692	205,424	3.7	153	4,090	3.7
School Districts:								
Arizona Western College	73.9	119.1	7,692	205,424	3.7	107	2,857	3.8
Northern Yuma Union High	73.9	119.1	7,692	27,469	28.0	139	497	28.0
Quartzsite Elementary	36.3	58.4	3,778	7,092	53.3	147	277	53.1
Vicksburg Elementary	18.7	30.1	1,946	2,439	79.8	65	82	79.3
Wenden Elementary	18.9	30.6	1,968	6,365	30.9	52	168	31.0
State of California	130.4	209.8	b	b	--	b	b	--
Riverside County	130.4	209.8	10,592	1,994,267	0.5	282	53,028	0.5
School Districts:								
Coachella Valley Comm. College	106.5	172.4	9,392	610,330	1.5	87	5,621	1.5
Coachella Valley Unified	32.0	51.5	1,753	53,384	3.3	86	2,621	3.3
Desert Center Unified	39.1	62.9	2,032	16,631	12.2	110	903	12.2
Desert Sands Unified	14.6	23.5	760	221,021	0.3	36	10,545	0.3
Palm Springs Unified	20.8	33.5	1,082	396,462	0.3	34	12,378	0.3

TABLE 3-10 (Cont'd)

Taxing Jurisdiction	Length of Line Miles (km)		IMPACTS ON ASSESSED VALUATION: Valuation of Line ($000)[b]	1977 Total Valuation ($000)[c]	Percent Increase	LINE IMPACTS ON POTENTIAL TAX REVENUES: Tax Payments of Line ($000)	1977 Total Tax Revenues ($000)	Percent Increase
School Districts (cont'd):								
Palo Verde Community College	23.8	38.3	1,326	49,707	2.7	12	436	2.8
Palo Verde Unified	23.8	38.3	1,326	49,707	2.7	68	2,546	2.7
Special Districts:								
Coachella Valley Mosquito Abtmt.	60.5	97.3	6,911	591,436	1.2	7	626	1.1
Coachella Valley Pub. Cemetery	85.7	137.9	4,547	291,038	1.6	1	84	1.2
Coachella Valley Recreation	46.6	75.0	2,425	273,964	0.9	4	411	1.0
Coachella Valley Storm Water	6.9	11.1	359	371,501	0.1	1	1,360	0.1
Coachella Valley Water	39.2	63.1	2,039	351,132	0.6	6	959	0.6
County Citrus Pest Control #2	60.5	97.3	6,911	1,701	406.3	906	223	406.3
County Road, #4	124.6	200.5	6,659	199,090	3.3	7	199	3.5
Desert Hospital	20.8	33.5	4,844	396,195	1.2	12	1,006	1.2
Desert Hot Springs Water	5.8	9.3	4,064	29,862	13.6	21	155	13.5
Desert Hot Springs Water Improvement	5.8	9.3	4,064	1,540	263.9	63	24	262.5
Desert Water, #6	5.8	9.3	4,064	1,995	203.7	22	11	200.0
Flood Control, #6	7.3	11.7	380	211,346	0.2	1	647	0.2
Palo Verde Cemetery	2.8	4.5	1,326	49,707	2.7	1	30	3.3
Palo Verde Hospital	23.8	38.3	1,326	49,707	2.7	1	41	2.4
Palo Verde Library	23.8	38.3	1,326	49,707	2.7	2	80	2.5

Sources: [a]Williams-Kuebelbeck & Associates, Inc., Final Report: The Socioeconomic Impact of the Proposed Palo Verde Nuclear Generating Station-Devers Substation Transmission Line (Marina del Rey, Cf., August, 1977).

[b]Including lines, substations, and communications stations.

[c]In these taxing jurisdictions, valuations have been consolidated for all taxable purposes, and valuations shown are combined figures; tax rate is average.

TABLE 3-11

ATTITUDES TOWARD THE PROPOSED ACTION

Statement	BUCKEYE			PARKER			PALO VERDE			CHUCKWALLA/DESERT HOT SPRINGS		
	Mean Score	Percent Agree	Percent Disagree	Mean Score	Percent Agree	Percent Disagree	Mean Score	Percent Agree	Percent Disagree	Mean Score	Percent Agree	Percent Disagree
In the long run, I am sure that we will be better off if the transmission line is constructed.	2.6	35	45	3.3	41	39	3.3	62	34	2.4	65	10
While some feel there is a need for new industry and jobs, we cannot afford to sacrifice our clean air and beautiful scenery to attain them.	2.9	33	33	3.0	32	34	2.9	36	46	3.2	15	35
There is too much concern by some for restricting economic growth and not enough concern for encouraging it.	3.4	57	21	3.6	61	26	3.6	59	28	2.3	65	15
Construction crews for the power plant may detrimentally effect the local community.	2.1	6	71	1.8	20	87	2.9	45	55	3.5	15	60
Increased population and economic growth should be encouraged because it will mean a better selection of goods and services.	3.5	63	26	3.3	55	31	3.3	52	32	2.2	80	5
More residents in this county will lower the quality of recreation and leisure activities.	2.1	13	80	2.1	15	75	2.9	48	48	3.8	10	80
	Note: The number of responses was 26.			Note: The number of responses was 47.			Note: The number of responses was 27.			Note: The number of responses was 14.		

Source: Harbridge House, Inc., 1977

revenues. Because levels of impact have been projected for a completion date of 1982, dollar amounts for the value of the transmission line have been discounted to 1977 dollars. Some taxing units would have potential revenues increased by as much as 406 percent, and all taxing authorities with jurisdiction over the line would gain.

SOCIAL AND CULTURAL CHARACTERISTICS

Residents of communities along the proposed Palo Verde-Devers transmission line perceive only a few ways in which the planned corridor might impact their lives. They envision no impact on lifestyles, and on most aspects of quality of life and social well being. The project is too small to have many primary or secondary social or economic impacts. A few concerns do exist, however. Chief among the fears expressed by respondents to specially conducted interviews was the idea that the applicant's proposal would adversely affect agricultural lands and seriously interfere with the farming of bisected properties. This view was strongest in rural areas which depend heavily upon farm and ranch income. At the same time, businessmen from nearby communities anticipated benefits from the project. Table 3-11 summarizes data obtained in field interviews.

IMPACTS OF A SECOND 500 KV TRANSMISSION LINE

As noted in chapter 1 under the heading INTERRELATIONSHIPS, an application has been filed with NRC for a license to construct two additional generating units at PVNGS. If the license is approved, there is a high probability that a second 500 kV transmission line would be required to transmit power to California.

In the absence of a firm proposal concerning the design of the second line, it is not possible to quantify the impacts in detail. The impacts can only be addressed in generalities. There are perhaps four methods of adding a second 500 kV line:

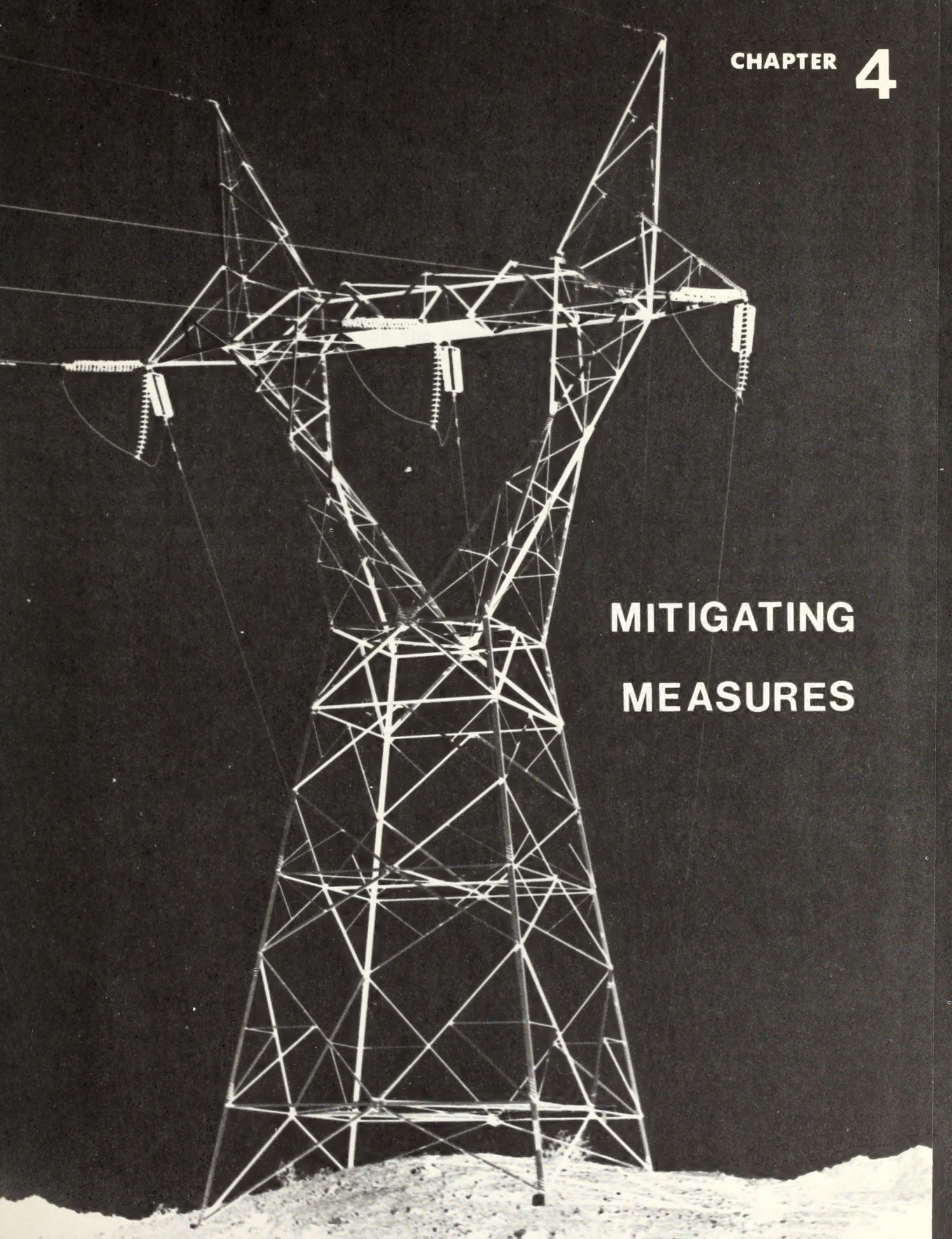
1. Using double-circuit towers for the full length;
2. A second set of towers constructed immediately parallel to the first line;
3. Using an entirely new corridor; or
4. Some combination of the three above.

In the double-circuit method, the impacts associated with surface disturbance or occupancy would be nearly identical to those identified previously in this chapter for a single 500 kV line. The major differences would be in the form of construction costs and visual impacts, since the towers would be considerably taller and heavier to support two 500 kV circuits.

Assuming that the same main access road would be used for construction, the impact of a second line immediately paralleling the first line would probably be less than double the impact of a single line. In some cases, such as visual impact and archaeology, it is possible that the cumulative impact of two lines would be more than twice the impact of a single line.

Using an entirely different corridor would result in an entirely different set of impacts which may have no relationship to the impacts identified in this statement.

The fourth method (a combination of the first three) is probably the most likely to be used. Due to the expense involved in double-circuit construction (nearly three times the cost of single-circuit, according to the applicant), the utilities would probably prefer to construct a parallel line. However, in restricted areas, such as narrow mountain passes or urban areas, it may be necessary to use double-circuit towers or deviate from the original alignment. In this case, the impacts could vary considerably, depending upon the amounts and locations of double-circuit construction or new alignment proposed.



CHAPTER 4

MITIGATING MEASURES

CHAPTER 4

MITIGATING MEASURES

INTRODUCTION

If a right-of-way is approved, Federal, State and local government agencies will issue permits for the powerline construction across areas under respective jurisdictions. Each government agency involved is obligated by laws and regulations to require measures that will mitigate environmental impacts. Specific measures to mitigate impacts must be real, committed and enforceable.

BLM requested each authorizing agency (letter dated January 6, 1978 in appendix) to define specific mitigation measures which will be required of the applicant. These measures will be incorporated by BLM into the right-of-way grant. Only those agencies which responded are mentioned below.

The California and Arizona BLM State Directors will appoint compliance officers with full authority to interpret and enforce stipulations included in the right-of-way grant.

Prior to the beginning of construction, the applicant will present a complete plan of operation to State BLM Directors and other authorizing agencies. The applicant shall agree to the regulations, mitigation measures, and other stipulations included in the grant of right-of-way.

Preconstruction conferences will be held in each State with the applicant and its contractors, where all authorizing agencies will explain stipulations in necessary detail to protect the environment and arrive at a mutual understanding of all mitigation measures.

MITIGATION MEASURES BY FEDERAL AGENCIES

BUREAU OF LAND MANAGEMENT

General Measures

The primary mitigation measures to be employed by the BLM are:

1. If BLM decides to grant the applicant a right-of-way permit, the next step is to select from a combination of proposed, alternate and/or

subalternate routes the best overall transmission line route. This decision will be based on a study of all resources and interests for each alternate and subalternate route.

2. Once a route is selected, the applicant will cooperate with BLM in decisions concerning the final location of (a) the centerline within the 2-mile-wide corridor, (b) each individual tower site, and (c) all other areas where surface will be disturbed, including access roads, construction and equipment yards, pulling stations, and other ancillary facilities.

The latter measure will provide mitigation for site-specific resources by placement of construction areas at a distance which will reduce or eliminate impacts.

Climate

There will be no mitigating measures concerning the climate.

Air Quality and Noise

Air Quality

Watering of roads and disturbed areas to control dust will be required as directed by the BLM authorized officer. Generally, watering will be required on roads and disturbed areas within 1 mile (1.6 km) of residences or other populated areas. Also, watering of roads will be required during periods of heavy vehicular traffic. Areas containing silty and loamy Argids, Orthids and Fluvents soils will produce large amounts of dust when the surface layer is destroyed or disturbed. These areas will require watering daily to control dust. Areas in the corridors with high potential for dust are shown by mileposts in figure 3-1 "Summary of Potential Fugitive Dust", chapter 3.

Noise

Equipment repair areas and construction yards will be located at least one-half mile (.8 km) from the nearest residence or business. This measure will reduce impact on local residents due to night repair operations, noisy equipment and helicopters. It is unlikely that noise from these activities could be completely isolated from urban areas.

Water Resources

No dumping of oil waste, toxic materials, solid or liquid waste will be allowed. Wherever possible, major drainages should be spanned, and access roads will be properly built in flood prone and flash flood areas

to avoid erosion and gullying. Caution will be exercised in the location of batch plants and pulling yards to avoid drainages during the rainy months of July, August, December and January.

Topography

Construction on steep slopes in mountainous areas will be avoided, and natural corridors will be used whenever possible. Tower pads and access roads on slopes will be designed to avoid erosion.

In restricted areas such as narrow canyons and mountain passes. the applicant will be required to either (1) construct double-circuit towers upon granting of the right-of-way, or (2) agree to replace the single-circuit towers with double-circuit towers (on the same alignment) if a second major transmission line is needed.

Geology and Mineral Resources

Tower sites are not to be located on existing fault scarps or known faults. The line will be located to avoid impacting any current underground or open-pit mining operation.

Soils

The necessary measures to effectively reduce soil impacts are included in chapter 1, as prior commitments by the applicant.

Vegetation

Vegetation mitigation is presented under General Habitats, Unique Habitats and Protected Species.

General Habitat Types

The applicant has established general procedures for vegetation mitigation in chapter 1.

Unique Habitats

Brenda Route

Mesquite Wash - Milepost 50

Towers will be spaced at the maximum distance to span the widest possible habitat. Towers will be positioned outside or very near the periphery of the habitat, if possible.

Palo Verde-Saguaro - Mileposts 65 to 80

No new main access roads will be permitted within the habitat.

The towers will be installed by helicopter or other means as approved by the authorized officer requiring no new main access roads or crane pads.

Palo Verde-Saguaro - Mileposts 94 to 96

No new access road construction will be permitted.

Towers will be placed by helicopter or other means approved by the authorized officer. An existing access road on the lower end of the canyon will be utilized.

Tamarisk-Riparian - Mileposts 104.6 to 105.2

Towers will be spaced at the maximum distance to span the widest possible habitat. Towers will be positioned outside or very near the periphery of the habitat if possible.

Sand Dunes - Milepost 123

Towers will be spaced at the maximum distance to span the widest possible habitat. Towers will be positioned outside or very near the periphery of the habitat if possible.

Chuckwalla Thicket - Milepost 128

If the Brenda Route is approved, no main access road will be allowed. (The applicant proposes to use the SOHIO maintenance road instead of constructing a new road through this area, if SOHIO construction precedes Palo Verde-Devers construction).

Dry Wash - Mileposts 183 to 183.6

Towers will be spaced at the maximum distance to span the widest possible habitat of the desert buckwheat. Towers will be positioned outside or very near the periphery of the habitat if possible.

Sand Dunes - Mileposts 205 to 208

Towers will be placed to avoid sand dunes and rare, threatened, endangered, or protected species.

Sand Dunes - Milepost 215

Construction will be restricted to the identified centerline of the corridor to avoid sand dunes and potential habitat of rare, threatened, protected, and endangered species.

Sand Dunes - Milepost 230

Towers will be spaced at the maximum distance to span the widest possible habitat. Towers will be positioned outside or very near the periphery of the habitat if possible.

Palm Oases - Mileposts 209 to 217

Existing main access roads will be utilized.

Indio Hills - Mileposts 207 to 232
(except Palm Oases)

Existing roads will be used to avoid rare, threatened, protected, and endangered species habitat.

Kofa Route

Mesquite Wash - Milepost 33

Towers will be spaced at the maximum distance to span the widest possible habitat. Towers will be positioned outside or very near the periphery of the habitat if possible.

French Wash - Mileposts 75 to 77

The existing road through the wash will be used.

Tamarisk-Riparian - Mileposts 102 to 102.6

Towers will be spaced at the maximum distance to span the widest possible habitat. Towers will be positioned outside or very near the periphery of the habitat if possible.

Dry Wash - Milepost 185

Towers will be spaced at the maximum distance to span the widest possible habitat of the desert buckwheat. Towers will be positioned outside or very near the periphery of the habitat if possible.

Creosote - Milepost 213

The centerline will be located to avoid impacting threatened, rare, protected and endangered plants and habitat.

State-Protected Species

Arizona

The law provides that the Arizona Commission of Agriculture and Horticulture be given at least 30-days notice prior to construction to allow inspectors an opportunity to check the area and salvage protected plants if necessary.

The applicant has generally addressed mitigation of Arizona State protected species in chapter 1.

On public lands administered by BLM, the applicant will be required to purchase Arizona protected plants which cannot be avoided. The plants will be appraised by BLM and sold to the applicant at fair market value. The applicant may then dispose of the protected plants in accordance with Arizona State Law. Salvage will be encouraged where practical.

California

The applicant has generally addressed mitigation of California State rare and endangered species in chapter 1.

BLM will conduct a field search for the following State rare, and endangered plants that may exist in the corridors:

Glandular ditaxis, Ditaxis adenophora
Little San Bernardino Mountain linanthus, Linanthus maculatus
Scaley-stemmed sand plant, Pholisma arenarium

Towers, roads and crane pads will be located to minimize impacts to these species, if located.

Federal-Endangered or Threatened Plant Species (Proposed FWS List)

Specific mitigation measures for the three proposed threatened species discussed in chapter 2 have been addressed in the Unique Habitat Section. Potential habitat for the mecca aster and foxtail cactus will be protected by utilizing the existing access roads where the plants have been identified.

BLM will conduct a further field search for individual plants of these threatened species prior to construction of roads, towers and ancillary facilities. Disturbed areas will be located to avoid impacting plants on the proposed threatened list.

If rare, endangered or threatened species on State or Federal lists are located during field inventories, a quantitative determination of population and abundance showing species distribution will be taken. Once this has been accomplished, BLM will ascertain whether the proposed action will jeopardize the continued existence of the species.

Wildlife

The applicant or its contractors will construct one additional big game watering facility for each existing one within 300 yards (274 m) of construction activities in bighorn sheep habitat. These facilities are to be similar to the existing ones and located on the opposite side of the right-of-way. The type and location of each new watering facility will be determined in conjunction with the BLM and the State Fish and Wildlife Agency.

Construction will cease during January, February, and March within the mountainous areas, adjacent to sheep lambing grounds. See map 2-7 for specific locations. Other locations may be identified in conjunction with State Wildlife Agencies. Any new roads developed through these areas will be blocked to prohibit vehicular travel during the lambing period.

The applicant will be required to instruct its field employees and employees of its contractors to refrain from needlessly harming wildlife. Employees will be requested to notify the applicant's biologist if they think they observe any endangered or threatened species. The applicant will periodically report such incidents to the authorized officer.

Other measures committed to by the applicant as shown in chapter 1, are also necessary to mitigate environmental disturbance along the entire length of the project.

Land Use and Ownership

The applicant will develop a plan acceptable to the FAA for marking the transmission line in agricultural areas and aircraft traffic areas, such as airports, and over the Colorado River.

All new or existing fences, gates, cattleguards, or other objects or structures within the right-of-way will be grounded.

All fences crossed by the proposed transmission line access road will be provided with an appropriate gate or cattleguard.

Where the access road crosses an existing gas pipeline the applicant is to provide additional surface material to maintain at least 5 feet (1.5 m) of cover or as specified by the owner.

The applicant will be required to mitigate impacts to existing facilities, i.e., pipelines, powerlines, telecommunications.

Wilderness Areas

No formal Wilderness Study Area designation has been made on any of the areas identified on map 2-12, with the exception of the Kofa Proposed Wilderness.

The boundaries of the PWSAs may change after public review and prior to designation by the respective State Directors.

In the present situation the transmission line could be routed within the corridors outside of any PWSA except the Chuckwalla Mountains, PWSA #8 and the Orocopia Mountains, PWSA #10. If the proposed transmission line is allowed to cross the boundary of a PWSA, the impact will be mitigated by moving the centerline as close to the boundary as is feasible. Visual impacts can be modified and made more acceptable by the use of nonspecular conductors and galvanized steel towers.

Visual and Recreation

Visual Resources

At highway crossings, towers are to be placed at the maximum feasible distance from the roadway.

Access road construction is to be limited in portions of the Dome Rock and Plomosa Mountains. Alternate construction techniques approved by the authorized officer will be implemented.

All conductors are to be of nonspecular material; towers are to be galvanized steel or aluminum except as otherwise approved by the authorized officer.

Communication site facilities will be painted or constructed of materials which will cause them to blend into the surrounding terrain.

BLM will approve all final construction locations and specifications.

Recreation

Construction will be curtailed during heavy recreational use periods, including major holidays in the following areas:

Area	Periods
Kofa National Wildlife Refuge	Weekends, November through March
Plomosa Mountains	" " " "
La Posa Recreation Site	January through March
Colorado River	Weekends and Holidays, especially: Easter Weekend period Memorial Day (Saturday through Monday) Independence Day (Weekend) Labor Day (Saturday through Monday)
Wiley Well Road	Weekends
Corn Spring Road	Weekends
Red Cloud Wash (Chuckwalla Mountains)	Weekends
Mecca Hills	Weekends

Guyed towers are not to be used in areas specified as "ORV Open Areas." See map 2-9.

Guyed towers will not be used in high density recreation use areas such as:

The La Posa Recreation Site
Kofa National Wildlife Refuge

Cultural Resources

Measures committed to by the applicant in chapter 1 are generally adequate to mitigate adverse impacts. Various impacts may be avoided or mitigated by either (1) shifting roads or towers away from cultural sites at a distance satisfactory to the BLM, or (2) where adverse effect upon cultural or natural resources cannot be avoided, impact mitigating measures will be implemented. Mitigation work falls into two categories: (1) that which will be accomplished after the applicant is granted a final transmission line right-of-way, but prior to actual beginning of any ground surface disturbing activities, and (2) that which will take place in situations where cultural resources may be found or uncovered within the study area during the construction stage. Specific impact

mitigation measures to regulate these situations are listed below (these measures will be included as stipulations in the final grant issued to the applicant).

Unless specifically relieved of some part of these requirements by the BLM, the applicant (upon receiving a corridor grant) will:

1. Mark or stake the transmission centerline and the parameters of all other construction-related ground surface areas which will be disturbed by the proposed project. Marking, staking and flagging will be done in a manner that will allow inventory crews to locate such areas without undue difficulty.

2. The applicant will engage an archaeologist (acceptable to the BLM) to conduct a thorough and complete intensive cultural resource inventory (BLM Class III) of:

   a. All areas within 200-feet (61 m) of the finally approved centerline (i.e., a 400-foot-wide (122 m) corridor) for the entire length of the corridor,

   b. All areas where any type of ground surface disturbing activity will occur (i.e., building new or widening existing access roads, construction-related yards and ancillary facilities), including a minimum 100-foot-wide (30.5 m) buffer zone beyond the area of actual intended construction activity, and

   c. Any area beyond the actual 400-foot-wide (122 m) corridor or construction areas which are determined to be culturally sensitive (e.g., current or proposed State or National Register Properties), and which could receive either direct or indirect impacts resulting from the proposed project.

Particularly intense inventory will be given all areas where construction-related surface disturbances will result in permanent alteration or loss of the current ground surface. Inventories will include full recordation of all evidences of archaeological, historical and paleontological values. Exceptions to the above will be made where it can be demonstrated to the satisfaction of the BLM and all relevant agencies that past applicant contracted cultural inventories correlate exactly with the final staked centerline, or other construction area, and have provided the required inventory for a given area.

Upon receipt of an inventory report (acceptable to the BLM) the applicant will, based on the findings of the inventory, prepare impact mitigation plans for all probable direct or indirect impacts in consultation with the BLM, the respective California and Arizona State

Historic Preservation Officers (SHPO), and the Advisory Council on Historic Preservation. The applicant will then, through an acceptable archaeologist, undertake salvage, avoidance, or other mitigation measures, as required by these agencies in advance of any ground surface disturbing activities.

3. Where specific information is available concerning locations of burial grounds or ethnobotanical areas, efforts will be made to reduce potential impacts by avoiding the areas or careful placement of roads, towers and other surface disturbing activities. Final mitigation plans will be approved by the BLM or other administering agency.

Any cultural or paleontological resource work, required by the above measures, shall be undertaken under the authority of a current Federal antiquities permit applicable to the area to be inventoried, investigated, or salvaged. Personnel will be qualified professional archaeologists or paleontologists who have an adequate research design for the region and who can insure a multi-disciplinary study and report. These mitigation measures facilitate compliance with current cultural antiquities laws and policies.

Abandonment of Completed Line

If the line is abandoned at any time, the applicant will submit a plan to BLM for the satisfactory removal of materials and restoration of the area immediately following a decision to abandon the line.

U.S. FISH AND WILDLIFE SERVICE

No mitigating measures were developed. See correspondence in chapter 9.

DEPARTMENT OF THE ARMY (Yuma Proving Ground)

No mitigating measures were developed. See correspondence in chapter 9.

NUCLEAR REGULATORY COMMISSION

Under NRC's licensing procedures, mitigating measures can be included as a condition to granting the license. Several mitigating measures were developed which were not committed to by either the applicant or the landowner or managing agency. If the project is approved, and depending upon route selection, NRC will include the following measures as a condition to granting a license.

If the Kofa Route is approved, no new access roads will be allowed from mileposts 88 to 90.5 (in Yuma Proving Ground). The applicant estimates that construction of the 2-1/2 miles of transmission line within the proving grounds would cost $794,000 if temporary roads and crane pads could be used, however, if it were necessary to construct utilizing helicopter techniques, the estimate is $1,548,000. Helicopter construction then would add $754,000 to applicant cost.

For each 1 acre (.4 ha) of known habitat of the Coachella Valley fringe-toed lizard that is permanently occupied (see table 1-4), at least 1 acre (.4 ha) of suitable habitat is to be purchased in fee title and transferred to the appropriate agency. England and Nelson, 1976, identified some small tracts of suitable habitat not yet destroyed by agriculture or development.

If the Brenda Route is approved approximately 17 miles (27 km) of fringe-toed lizard habitat will be impacted. At three tower sites per mile this would amount to 51 tower sites. If the Kofa Route is approved only 5 miles (8 km) of habitat will be impacted. Regardless which route is selected permanently occupied habitat will not exceed 1 acre (.4 ha). Suitable acreage proximate to the areas impacted has been selling for $500 per acre (.4 ha).

BUREAU OF RECLAMATION

No special mitigation measures are required other than those proposed by BLM for visual resources and erosion control.

BUREAU OF INDIAN AFFAIRS

No mitigating measures were developed. See correspondence in chapter 9.

MITIGATION MEASURES BY STATE AGENCIES

ARIZONA DEPARTMENT OF TRANSPORTATION

The applicant must obtain the necessary permits from the Department of Transportation whenever the line crosses a highway. Transmission towers must be located no closer than 200 feet (61 m) from highways.

CALIFORNIA PUBLIC UTILITIES COMMISSION

A separate Environmental Impact Report was prepared based largely on BLM's Draft Palo Verde-Devers ES. Mitigation measures have been developed by the Commission. Wording differs somewhat from that presented in this document, but not apparent intent.

CALIFORNIA STATE LANDS COMMISSION

No specific measures were developed. When a final route is selected, the applicant will coordinate measures on State lands with the Commission.

MITIGATION MEASURES BY LOCAL AGENCIES

MARICOPA COUNTY HIGHWAY DEPARTMENT

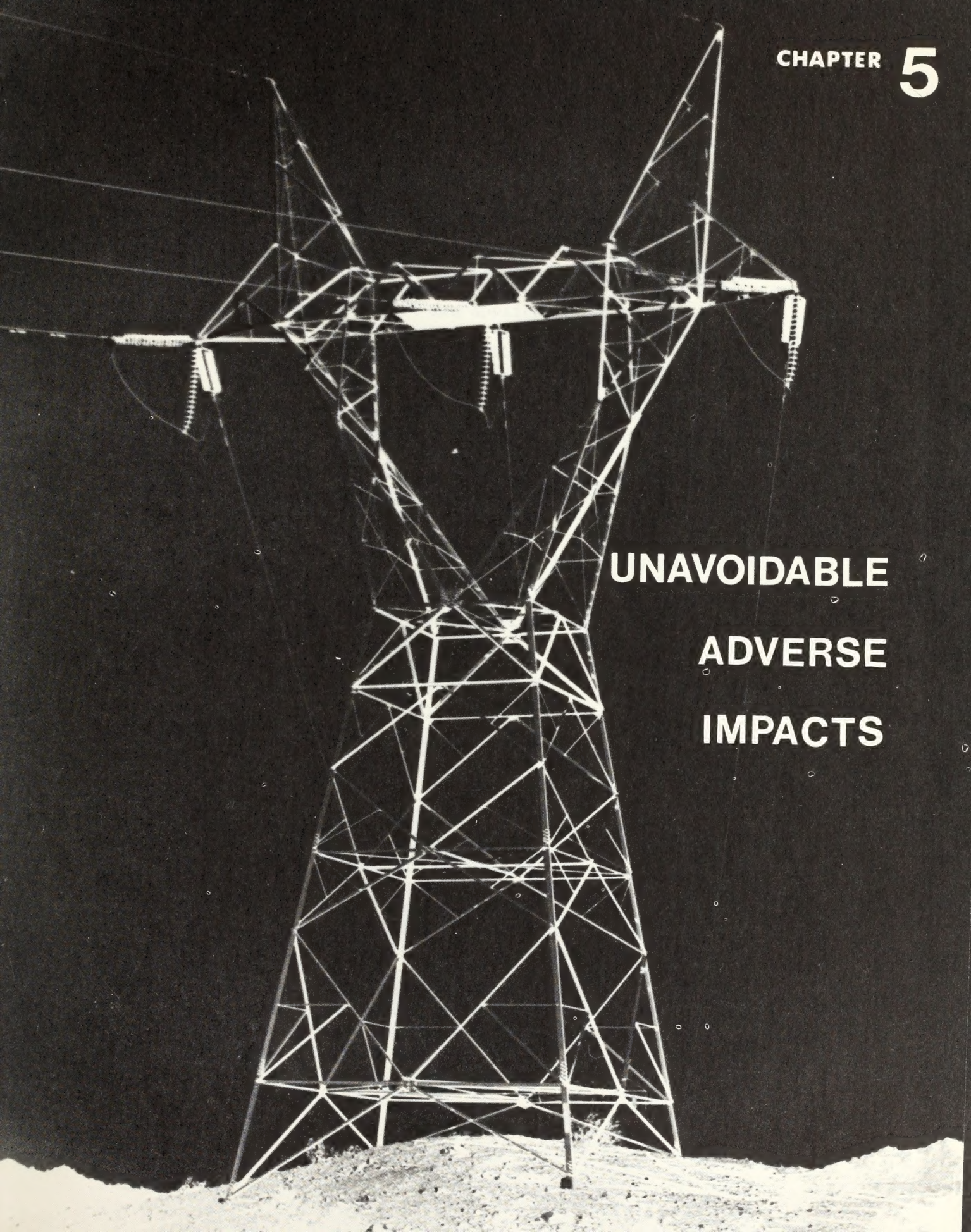
None of the proposed routes are in conflict with known projects. No part of any tower or structure is to be closer than 55 feet (16.8 m) to any road or section line which is or may become a major highway.

APPLICANT COMMITTED MEASURES

The environmental analysis submitted by the applicant as part of its application contains numerous mitigation measures included in chapter 1. These measures are necessary and required, but are not repeated except to clarify or expand where the applicant's proposed mitigation was not considered adequate. An additional applicant committed measure is described below.

MONITORING AND RESEARCH PROGRAMS

SCE is supporting a study of bighorn sheep ecology to determine the impacts of transmission line construction and operation. This study will be adequately funded for a 5-year period by SCE and APS. Specific details on this research project are available at the BLM District Office in Yuma, Arizona. The results from this research are expected to assist biologists in predicting impacts and developing adequate mitigation measures for bighorn sheep.



CHAPTER 5

UNAVOIDABLE ADVERSE IMPACTS

CHAPTER 5

UNAVOIDABLE ADVERSE IMPACTS

The following is a summary of the unmitigated adverse impacts that would remain if the proposal is implemented and effective mitigating measures discussed in chapter 4 are applied.

AIR QUALITY AND NOISE

Unavoidable impacts will be essentially the same as anticipated impacts discussed in chapter 3 with some lessening of degree, resulting from mitigating measures. Primary residual impacts will be airborne particulates from dust and vehicle emissions and a slightly increased noise level from vehicles, aircraft and corona discharge during and after construction.

Dust would be the primary unavoidable adverse impact on air quality. Construction caused dust will be local and short-term. Of more concern is fugitive dust caused by wind and vehicle traffic after construction has been completed. Pollutants from construction equipment will be short-term and generally insignificant.

MINERAL RESOURCES

No unavoidable adverse impacts on mineral resources are expected.

SOILS AND WATERSHED

Between 456 and 559 acres (185-226 ha) of soil (depending on the route selected and construction method) would be permanently impacted by the proposed transmission line. These impacts include surface soil disturbance in areas requiring construction of access roads and towers. Under normal conditions, soil losses due to natural effects are approximately 400 lbs. to 1,000 lbs. (181.6 kgs to 454 kgs) per acre (.4 ha) per year. The activities associated with construction could create bareground conditions resulting in up to 8 to 10 tons (7.2 to 2.07 Mg) of soil loss per acre (.4 ha) per year. This rate will decrease gradually as vegetation becomes reestablished.

VEGETATION

GENERAL HABITAT TYPES

Unavoidable long-term destruction of vegetation will occur from construction of main access and spur roads. Temporary destruction of vegetation is unavoidable at tower construction and erection sites; revegetation here will take from 35 years to centuries to approach the vegetative quality of undisturbed areas. A minor enhancement of vegetative growth will occur under conductors; also, significant vegetation enhancement will occur along roadsides.

Unique Habitats

The most significantly affected areas are the unique habitat areas. The Brenda and Kofa Routes contain the following areas with high to medium anticipated residual impacts:

BRENDA

Habitat	Milepost	Impact
Palo Verde-Saguaro	65-80	Medium
Palo Verde-Saquaro	94-96	Medium
Chuckwalla Thicket	128	High*
Sand Dunes	123 and 128	High*
Dry Wash	185	Medium
Palm Oases	209-217	Medium

KOFA

Saguaro-Agave and Palo Verde-Saguaro	88-90.5	Medium
Dry Wash	183	Medium

* Impacts to these very unique areas can be avoided by utilizing the Kofa Route.

Increased access to previously undisturbed areas by off-road vehicle users will result in an unavoidable impact on vegetation.

STATE-PROTECTED SPECIES

Arizona: It is anticipated that some State protected species will be destroyed.

California: Impacts to rare and endangered State species are expected to be low; although, their distribution and locations are not well known.

FEDERAL-PROTECTED SPECIES (Proposed FWS List)

It is anticipated that there will be insignificant impact to the threatened species following implementation of mitigation procedures.

WILDLIFE

Construction activities will result in permanent loss of wildlife food, shelter and nesting areas on tower sites and new roads. This loss is insignificant over most of the route, with the exception of unique areas such as palm oases, sand dunes and dense woodlands, as shown on map 2-7.

Secondary impacts will occur to all wildlife species from new and improved access roads into areas previously having limited access. This unquantifiable impact is expected to increase the poaching of sheep and other wildlife, shooting of raptors, habitat destruction from off-road vehicles and the disturbance of sheep lambing areas.

LAND USE

The area permanently removed from agricultural production would be 4.11 acres (1.7 ha) along the Brenda corridor and 2.65 acres (1.1 ha) along the Kofa corridor.

Tower placement will interfere with an unknown number of crop beds which might complicate plowing and irrigation. The transmission line will create a hazard to crop dusting aircraft in agricultural areas. The line could also create a potential hazard to low flying aircraft along the Colorado River.

There will be an unavoidable visual impact on residents along the selected corridor. Visual impact would continue for the life of the project.

There will be a short-term disruption of traffic at highway crossings during construction.

RECREATION

The greatest residual impacts of the proposed action may be caused by the visual intrusion of transmission lines and associated roads into undisturbed areas.

Visual intrusion of the transmission line upon the existing landscape will be mitigated to some degree by coloration and nonskylining measures, but residual visual impacts will continue to be evident throughout the life of the proposed project.

The residual impacts of access roads will continue well beyond the life expectancy of the proposed action.

The proposed powerline will constitute an intrusion that will affect the recreational experience in isolated and scenic areas and in areas where overnight camping is occurring. This is especially true in the Kofa National Wildlife Refuge, La Posa Recreation Site and along the Colorado River.

Construction of powerline roads will result in an unavoidable impact by increasing recreational access to previously remote areas.

WILDERNESS

If the right-of-way is granted within either the Brenda or Kofa corridors and the mitigating measures identified in chapter 4 are implemented, some visual impact would still occur.

VISUAL RESOURCE MANAGEMENT

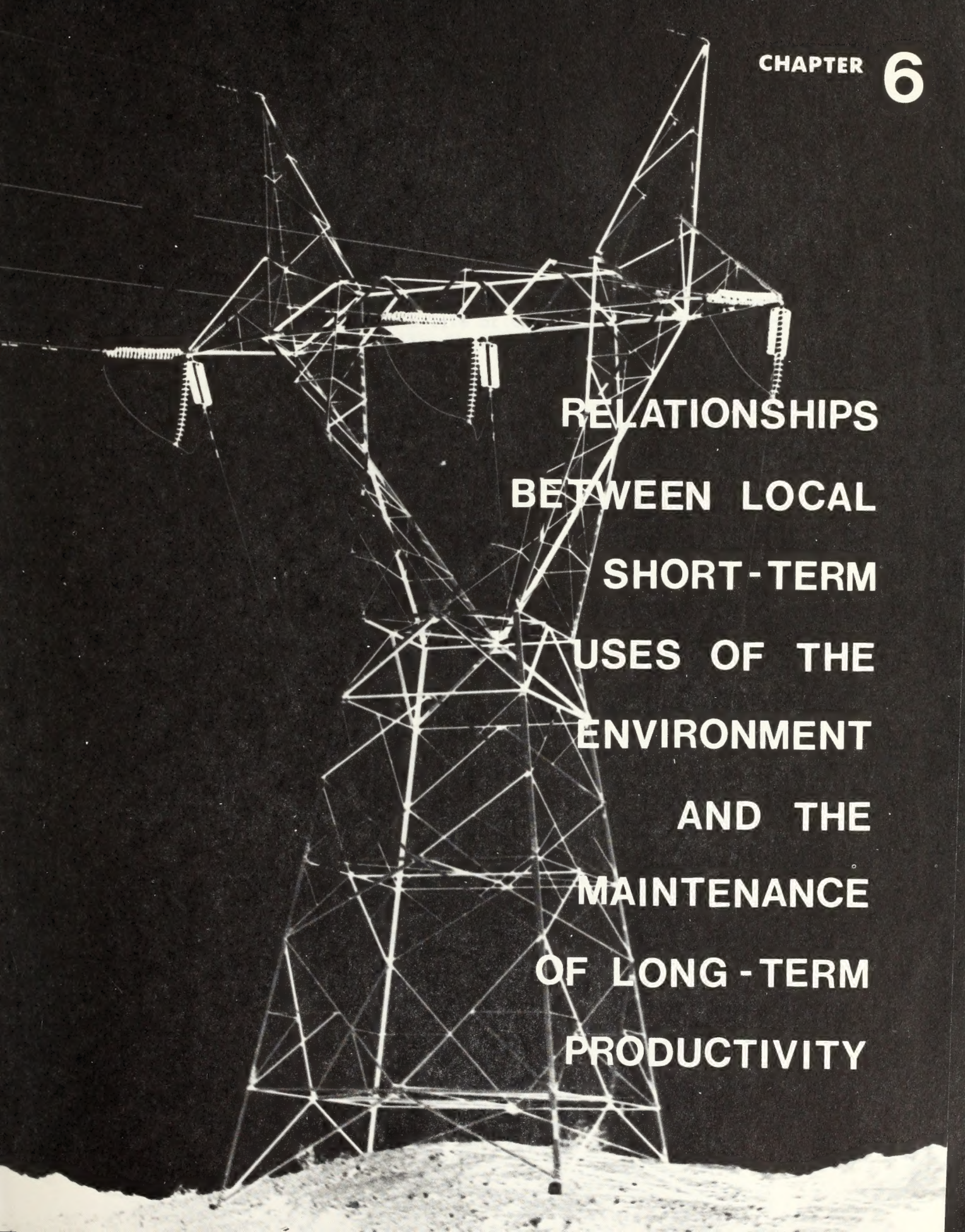
The existence of towers and lines will result in visual impacts which cannot be completely mitigated or avoided. Visual intrusion will be present.

CULTURAL RESOURCES

It is not possible to completely control human activity along the corridor at any time. A certain amount of adverse cultural resource impacts will remain unavoidable. In addition, there may be adverse impacts to resources which have not been previously located by cultural inventory (e.g., buried or undiscovered sites).

SOCIOECONOMIC CONDITIONS

Unavoidable adverse impacts on socioeconomic conditions from the proposed action are those identified in chapter 3.



CHAPTER 6

RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

CHAPTER 6

RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

For purposes of this analysis, short-term is defined as a period of 50 years (the proposed economic life of the project), and long-term is defined as the period that follows the economic life of the project.

Within the estimated economic life of the Palo Verde-Devers Project, the construction phase would preempt a small portion of land from recreational, rangeland, mineral extraction, agricultural and wildlife uses. Following the transmission line and communication site installation, the operational phase will allow the majority of the construction route to begin to revert to its preconstruction use. Operational use of the environment involves maintenance roads and communication facilities and the transport of electricity.

Even though project life is estimated at 50 years, industrial history suggests any structure existing for 50 years can be considered permanent or long-term. Whether the same structure remains or a replacement structure for different use is built, it is probable that once the development of the Palo Verde-Devers transmission line begins, the course of action will not be reversed 50 years later.

In most cases, existing transmission line corridors are upgraded in response to increasing demands. The proposed transmission line will parallel existing utility corridors for 82 miles (132 km), further committing the land to utilities purposes. As long as the demand and load center exist, current rights-of-way will probably continue to be the best available routes from generation source to consumer.

Both short-term and long-term development will alter the long-term productivity of natural resources within the area. The major change will occur along the transmission route where about 456-559 acres (186-226 ha) of land will be permanently occupied by man-built facilities and about 1,286 to 1,392 acres (520-564 ha) of land will be temporarily disturbed by the project.

Short-term and long-term use of the various resources such as soils, vegetation, wildlife, and related resources such as visual, recreational, and cultural would be affected by the project in different ways. These resources would remain productive, however, soils, vegetation, and wildlife will decline and eventually reach a new level of stability at a lower production rate.

Some of the short-term and long-term effects that might result from implementation of the proposal, include soil loss through erosion, vegetative loss and disturbances, wildlife loss and displacement, visual effects of construction scars and towers, increased access in some areas, aesthetic losses and future land-use planning decisions resulting from the physical presence of the transmission line. These effects cover only a small part of the total resource area, but are still considered significant impacts. The visual effect of the transmission line would not be felt over the long-term if towers are removed at the end of 50 years.

A possible long-term beneficial effect associated with the completion of the project would be increased recreational use of the areas due to improved access roads.

The short-term utilization of the land for a transmission line right-of-way could affect existing roadless areas for future consideration as wilderness.

Cultural resources are nonrenewable. The primary effect to cultural resources will occur during short-term construction use. Some of these effects could have long-term consequences such as the loss of aesthetic, archaeological, historical and paleontological resources.

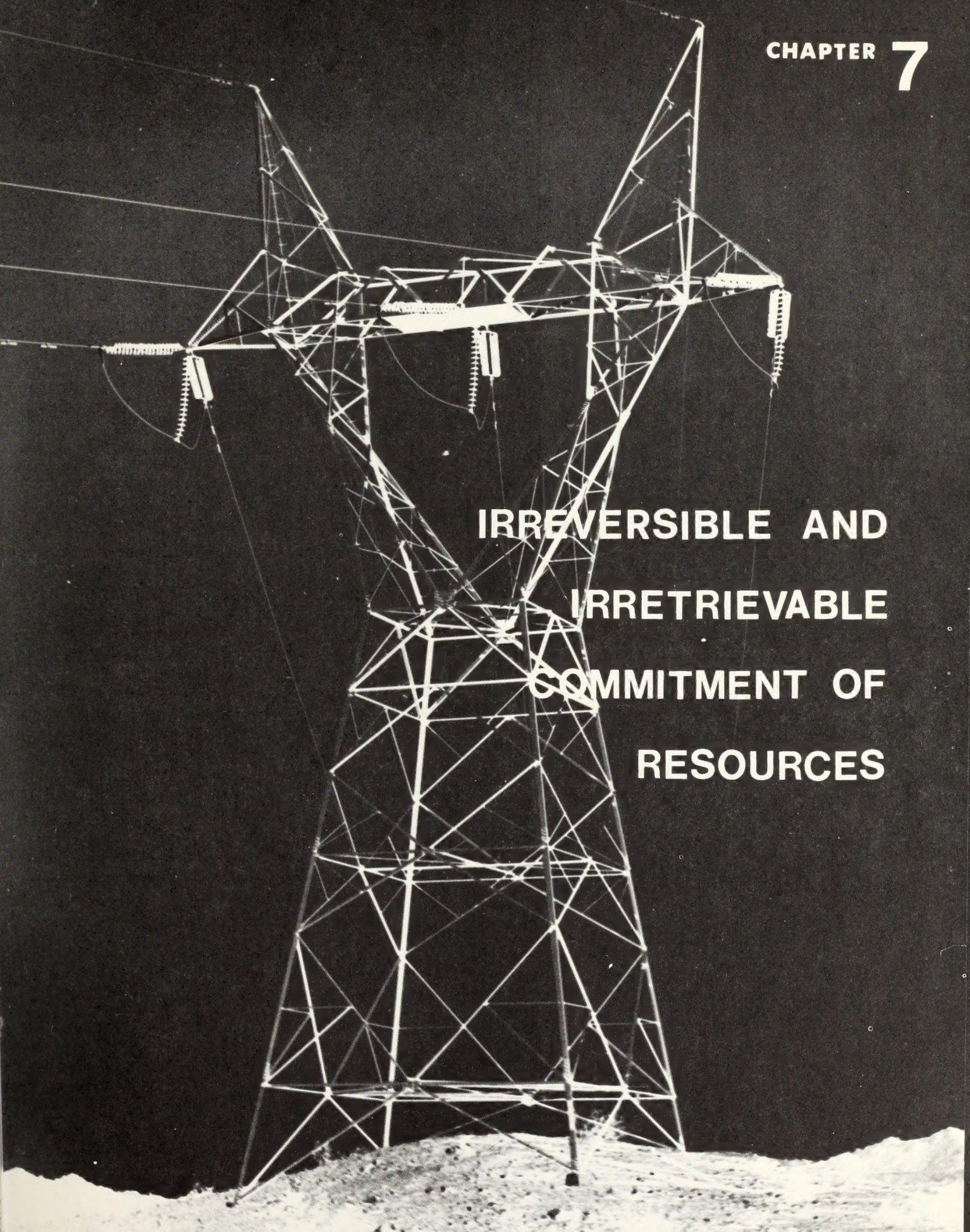
Any route selected in the Palo Verde-Devers corridor will have a long-term effect on future transmission line right-of-way routings.

The construction and operation of the proposed Palo Verde-Devers transmission line to some extent involves the use of a limited resource, prime agricultural land in Arizona. It also involves the sacrifice, to the extent it is perceived, of the visual quality and aesthetics of a few communities. The farm cost of the project is uncertain, insofar as the applicant might lease back some valuable lands in the right-of-way. The chief obstacle to renewed agricultural production would be the perceived problems in crop dusting, which cannot be quantified.

The costs of operating and maintaining the transmission line would be insignificant. Presently employed personnel would be used on a part-time basis. In all instances, the short-term use of the right-of-way by the applicant is not likely to impede long-term factors influencing the growth of adjacent communities.

In summary, many of the long-term effects are dependent on the continued existence of the powerline. For the reasons stated previously, it is likely that an electric transmission system will continue to exist in the established corridor.

CHAPTER 7



IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

CHAPTER 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

INTRODUCTION

Irreversible commitment of resources implies that those resources such as land used for roads, once committed to the transmission line would continue to be committed for the economic life of the project. Once the right-of-way is granted the revocation of permits, cessation of operations, or removal of structures is unlikely.

Irretrievable commitment of resources to the project involves those resources which are used, consumed, destroyed or degraded during the construction and/or operation of the project. These resources are lost and cannot be retrieved, replaced or recovered for the life of the project (50 years).

The project could be considered irreversible if future generations are committed to its use.

AIR QUALITY AND NOISE

It is anticipated that increases in airborne particulates brought about during construction will decrease again to present levels.

Audible corona noise and radio interference will cease if use of the line is discontinued.

WATER RESOURCES

No long term effect on water resources is expected.

TOPOGRAPHY

Cuts and fills along access roads in mountainous areas will be evident far beyond the life of the project.

GEOLOGY AND MINERALS

The transmission line is not expected to have any long-term effects on geology. Minerals removed from potential extraction under tower sites are not significant since each site is a maximum of 240 square feet (73.2 m) Metals used in structures are committed for the life of the project but may be reclaimed as scrap or reused. Fuels, concrete and other items burned, destroyed, or buried constitute an irretrievable commitment of resources.

SOILS

It is anticipated that soil loss in the corridors would constitute the greatest irretrievable commitment of a resource because soil formation in the arid southwest desert is slow. It has been estimated that it takes 1,000 years to form 1-inch (25.4 mm) of soil in this region.

Estimated soil surfaces that would be temporarily occupied by roads, towers, communication sites and work areas are as follows:

Corridors	Estimated Acres (ha) Temporarily Occupied
Brenda	1,392 acres (564 ha)
Kofa	1,286 acres (520 ha)

Estimated soil surfaces that would be permanently occupied by roads, towers and communication sites are as follows:

Corridors	Estimated Acres (ha) Permanently Occupied
Brenda	559 acres (226 ha)
Kofa	456 acres (185 ha)

Soil loss to water erosion will be minimized by mitigating measures. Wind erosion would occur until endemic plants are reestablished. If the access roads are frequently used by ranchers and recreationists, revegetation would not take place.

VEGETATION

Areas used for transmission line tower sites and work areas (pulling stations, construction yards and batch plants) constitute a reversible commitment of resources. Construction in these areas will result in the

crushing of vegetation; however, the vegetation will be permitted to recover. Substantial vegetative recovery can be expected to take at least 35 years for most shrub species (Vasek, 1975). Consequently, these areas are potentially a retrievable resource during the economic life of the project.

Areas cleared of vegetation for access roads will be irreversibly lost for the life of the project.

If the powerline is removed after 50 years, substantial recovery of vegetation on roads is expected to require more than 35 years because road construction and 50 years of use constitute a drastic soil disturbance. In areas of low precipitation with poor, rocky soil the recovery potential may be measured in centuries (Johnson, 1975).

WILDLIFE

The long-term effect of transmission lines on wildlife is unknown because most creatures appear capable of adapting to this type of disturbance. However, the secondary effect of increased human intrusion is detrimental to animal populations. Sensitive species such as bighorn sheep, mountain lion and desert tortoise may be irreversibly affected by the disturbance brought about by increased access to potentially critical habitat.

LAND USE

The transmission line rights-of-way, roads, and towers represent irreversible land use commitments for the life of the project.

Given the increasing environmental difficulty in routing utilities, it is likely that the transmission line corridor if abandoned, would be used again rather than being permitted to revert to the natural environment.

VISUAL, RECREATION, AND WILDERNESS

If a right-of-way granted for this project is designated as a "right-of-way corridor" as defined in Section 503 of the Federal Land Policy and Management Act of 1976, impacts to visual resource, recreation use and wilderness values will continue and increase.

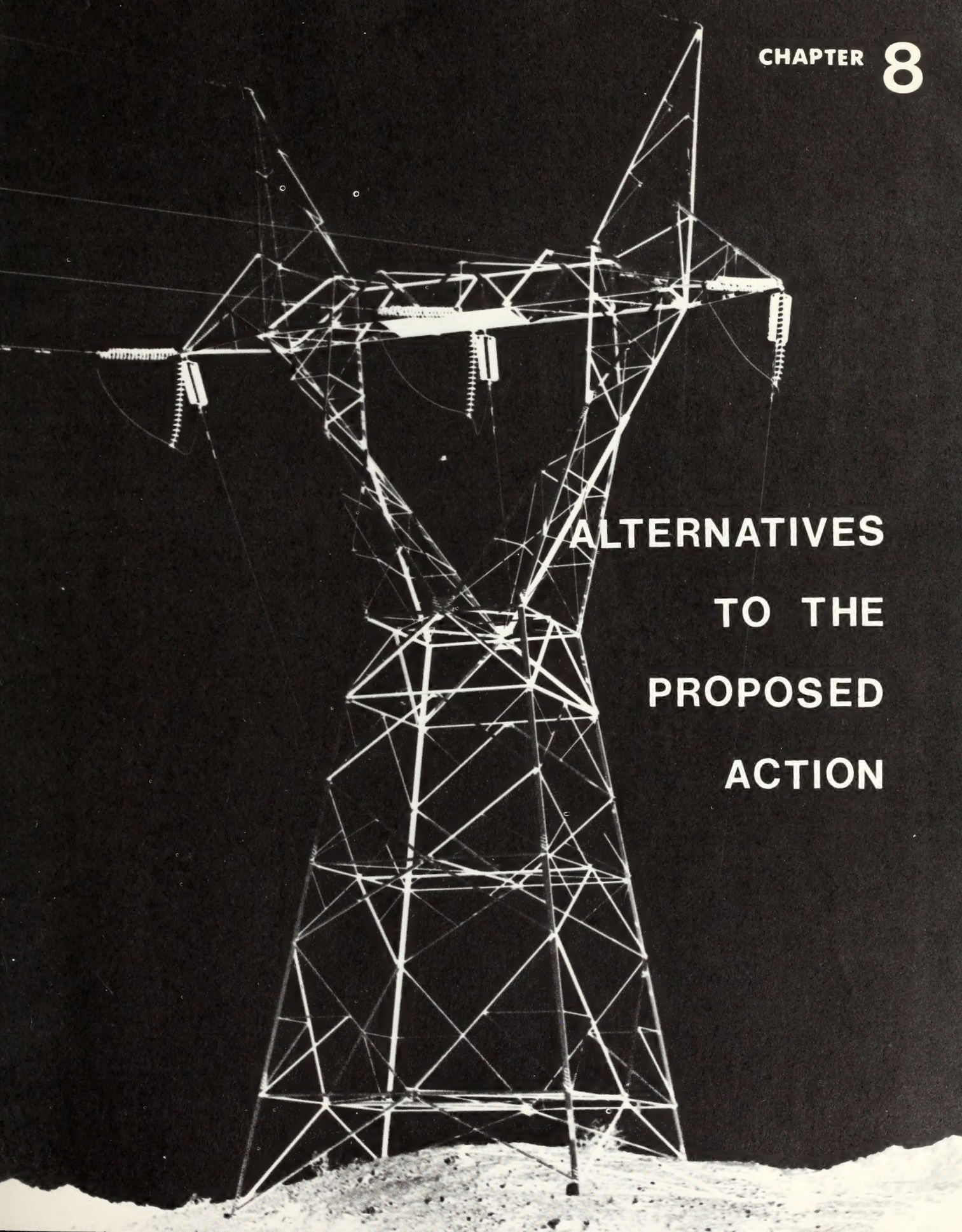
CULTURAL RESOURCES

Conditions which could lead to irretrievable loss of cultural resources would be caused by damage or destruction to any type of undiscovered cultural resource. Known resources would also be irretrievably lost if impacts have not been properly mitigated. It is probable that public access improved by the proposed project will lead to some irreversible impacts to cultural resources.

SOCIOECONOMIC CONDITIONS

The proposed action would result in two irreversible and irretrievable commitments of resources. The first would be the expenditures, materials, and employment required to build the line--an estimated $117 million and as many as 356 man-years. The second commitment would involve the loss of agricultural productivity in areas along the line--at least $1,531 a year along the Brenda Route and $985 a year along the Kofa Route. Farmers and ranchers anticipate even greater monetary losses as a result of perceived difficulties in production on lands along the line.

CHAPTER 8



ALTERNATIVES TO THE PROPOSED ACTION

CHAPTER 8

ALTERNATIVES TO THE PROPOSED ACTION

NO ACTION ALTERNATIVE

New transmission facilities are required to meet system needs resulting from load increases. Nonconstruction would also result in increased risk of power failures to the applicant's service area. Power failures will have a significant impact on residential, industrial and commercial users as well as the health and welfare of the public in general. The need for this power was established in the PVNGS Final Environmental Statement (U.S. Nuclear Regulatory Commission, 1975). Quality of life and economic development would be adversely affected in SCE service areas if this line is not built.

In addition, Maricopa, Yuma and Riverside Counties would not experience the economic stimulus of powerline construction. Capital spending and personnel hiring would not occur. Although the loss of this investment would not be significant in the three-county region as a whole, it would deprive Blythe of nearly $300,000, 2.8 percent of existing business levels (Socio-Economic Study by Harbridge House, 1977).

DELAY OF CONSTRUCTION

To transmit excessive power on existing transmission lines would severely degrade the transmission service in terms of performance, reduced reliability and higher energy losses.

If the proposed action is delayed, restrictions on the transfer capability between PVNGS and the load centers would result. Under such conditions substantial costs for replacement energy would be incurred. The probability of power shortages resulting in blackouts also would increase significantly.

Delaying construction would be beneficial to the environment only if technological improvements or changes in demand were anticipated. Delay of construction would probably result in increased cost for materials and labor.

UPGRADING EXISTING TRANSMISSION LINES

Presently there are no existing transmission lines directly between PVNGS and the Devers Substation. Lines indirectly connecting these two locations are either being fully utilized or are already committed to future requirements.

Upgrading an existing line for higher capacity will result in less impacts to all resources during construction activity. Some additional visual impact may result when larger towers are used. The major limiting factor in the use of this technique is the loss of existing lines from service during the upgrading process, a step which cannot be taken where the existing line is needed for continued service. Since the purpose of the proposed action is to meet growing power demand while maintaining reliability, upgrading existing lines is considered an unacceptable alternative.

NEW METHODS OF TRANSMISSION

No basically different method for bulk transmission of electric energy from generating source to load centers is presently available, (PVNGS Environmental Statement). There is considerable ongoing research into possibilities of microwave and laser transmission of energy, undergrounding of high voltage lines, and improved storage devices. However, these methods are not currently practicable for long distance transmission and cannot be considered as alternatives to the proposed action at this time.

LIMITING CONSUMPTION OF ELECTRICITY

An alternative which could reduce the size and number of new transmission facilities needed to serve the applicant's service area is a reduction in consumption of electricity. A reduction in peak demand could defer the need for a new facility. Due to the diverse and growing economy in Southern California, a voluntary decrease in consumption is highly unlikely. Even if a reduction could be obtained, the growth of the area would still result in an eventual need for additional power. A summary of the applicant's 1977 conservation programs is included in the appendix.

PREVIOUSLY CONSIDERED ROUTES

In addition to the Palo Verde-Devers transmission system discussed in previous chapters, two alternative systems were studied and discarded.

The first alternative consisted of a new substation at Red Lake Canyon, located 13 miles (21 km) north of Williams, Arizona. A new 148 mile (238 km) 500 kV transmission line was to be constructed from the new substation to the existing Mohave Generating Station located in the southern portion of Clark County, Nevada, just west of Bullhead City, Arizona.

Unlike the Palo Verde-Devers transmission system, the Mohave-Red Lake Canyon alternative would not provide additional transmission facilities west of the Colorado River. Since the Kaiparowits Project is no longer planned, the associated transmission system west of the Colorado River is no longer available for integration with the Palo Verde transmission system. Studies indicated that the existing transmission system does not have sufficient capability to transfer the PVNGS power from Mohave to Southern California load centers. The area west of the Colorado River would be exposed to conditions similar to those identified for the alternative of no action. Therefore, the Mohave-Red Lake Canyon alternative was unacceptable.

The second alternative system consisted of a Mohave-Red Lake Canyon 500 kV transmission line along with a 187-mile (301 km) Devers to Mohave 500 kV transmission line. The combined mileage of the Devers-Mohave-Red Lake Canyon alternative would be 335 miles (539 km) approximately 100-miles (161 km) longer than the proposed line. Although this alternative would have provided adequate system performance, it would have resulted in greater environmental impact and higher costs of such magnitude as to be excluded from further consideration.

Alternate routes shown on map 8-1 were previously considered by the applicant and BLM but were not addressed in the ES for one or more of the following reasons:

Anticipated environmental impacts were considered too severe on one or more of the following resources: Indian lands; natural areas; critical wildlife habitat; roadless areas.

The alternatives demonstrated no advantages over the studied routes.

Costs of these alternatives were unacceptably high to the applicant.

(Some of the alternative routes in California were addressed in the Final Sundesert Environmental Statement.)

SUBALTERNATE ROUTES

The various subalternate routes were developed to avoid anticipated impacts on the Brenda and Kofa Routes. The chapter 2 description of the study area also includes the subalternate routes. Maps 8-2, 8-3, and 8-4 present a summary of impacts identified along the subalternate routes. A graphic presentation of these impacts and definitions of impact levels (high, medium, low) for each resource are included in chapter 3. Appropriate mitigation measures in chapters 1 and 4 will be applied if any of the subalternative routes are selected for the right-of-way. Specific data on cultural resource density, sensitivity and impacts per subalternate route are contained in tables 8-1, 8-2, 8-3, and 8-4. Where impacts vary at specific points along the corridors, the worst case impact was used.

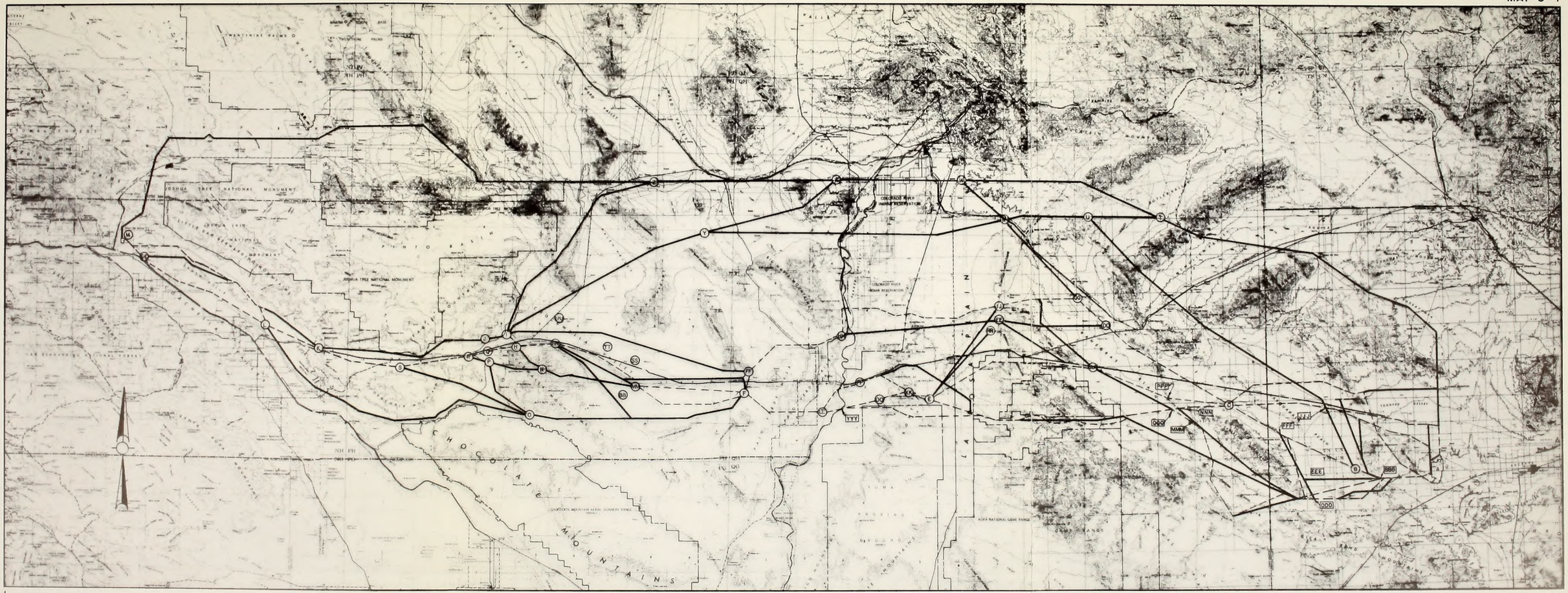
The following data shows the additional distance and increased construction cost based on $324,000 per mile for each subalternate, in comparison to the Brenda Route.

	G-H	J-K-L	D-E-F	A-B	C	M	N	P
Additional Miles	5.0	10.5	6.5	3.0	4.0	0	3.0	11.5
Kilometers	8.0	15.3	10.5	4.8	6.4	0	4.8	18.5
Cost in Thousands $	1,620	3,078	2,106	972	1,296	0	972	3,726

SUBALTERNATE ROUTE G-H

This route will require new access roads along most of the route. These roads will be over relatively flat terrain. See map 8-2 for impacts on this subalternate. Medium impacts are generally anticipated during construction and low impacts during operation or abandonment phases. Secondary impacts from new access into the Eagletail Mountains will be low due to flat terrain and existing access roads and trails.

This subalternative will add approximately 5 miles (8 km) to the Brenda Route with an additional construction cost of about $1,620,000. There will be a high impact in the west side of segment H as it passes adjacent to Proposed Wilderness Study Area number 2. This will be a result of crossing the east side of the area. Moving the line to the east side of the corridor will result in medium visual impacts.



LEGEND

DISCARDED ALTERNATIVE ROUTES

ALTERNATIVE ROUTES UNDER STUDY

SOURCE: APPLICANT

UNITED STATES

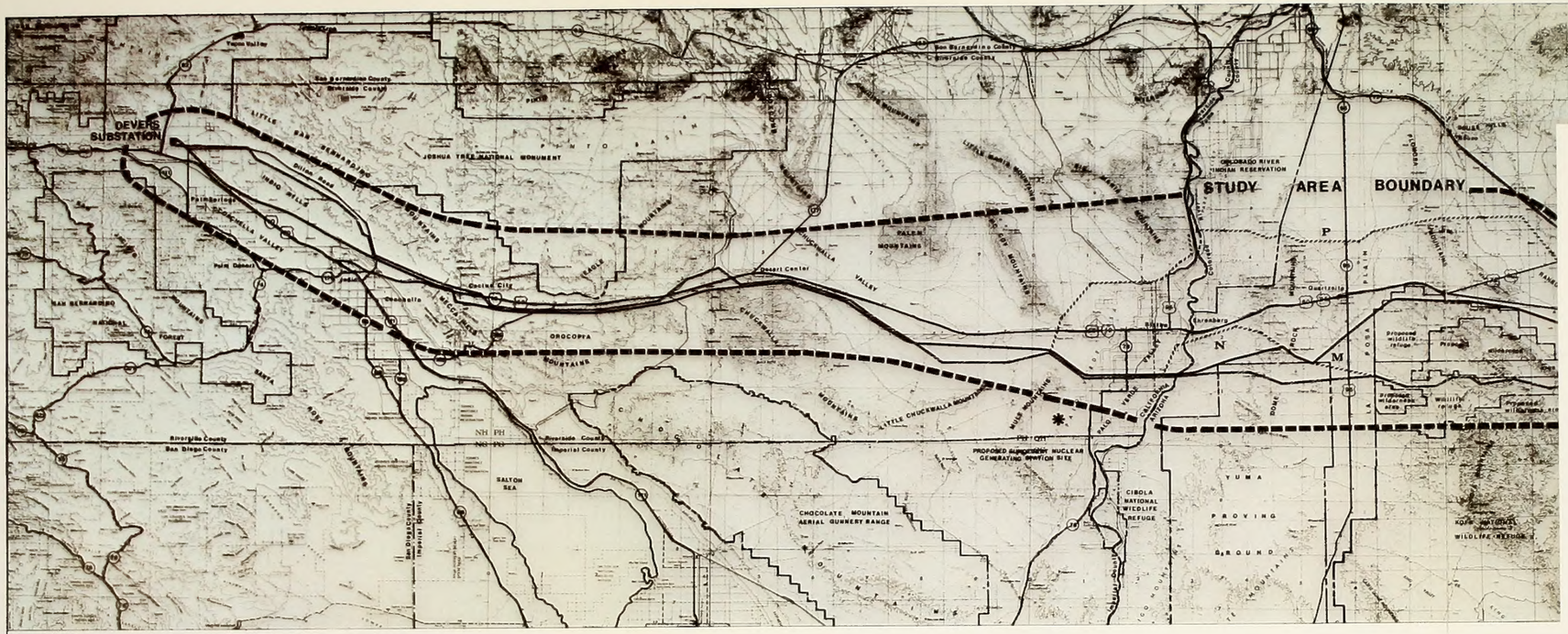
DEPARTMENT OF THE INTERIOR

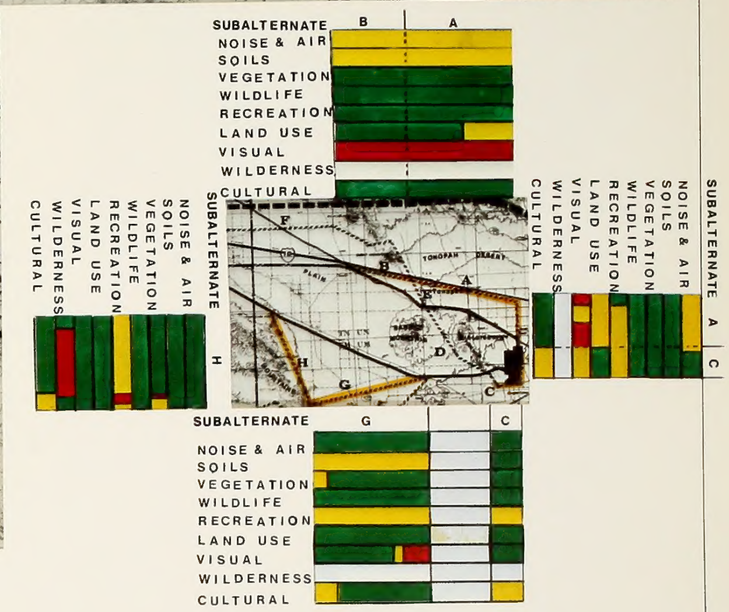
BUREAU OF LAND MANAGEMENT

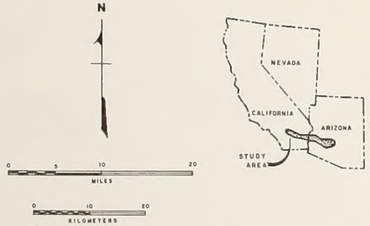
PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

DISCARDED ALTERNATIVE ROUTES







ROUTES UNDER STUDY

BRENDA

KOFA

SUBALTERNATES

A

LEGEND

SUBALTERNATES

HIGH

MEDIUM

LOW

NONE

SOURCE: SEE TEXT

UNITED STATES

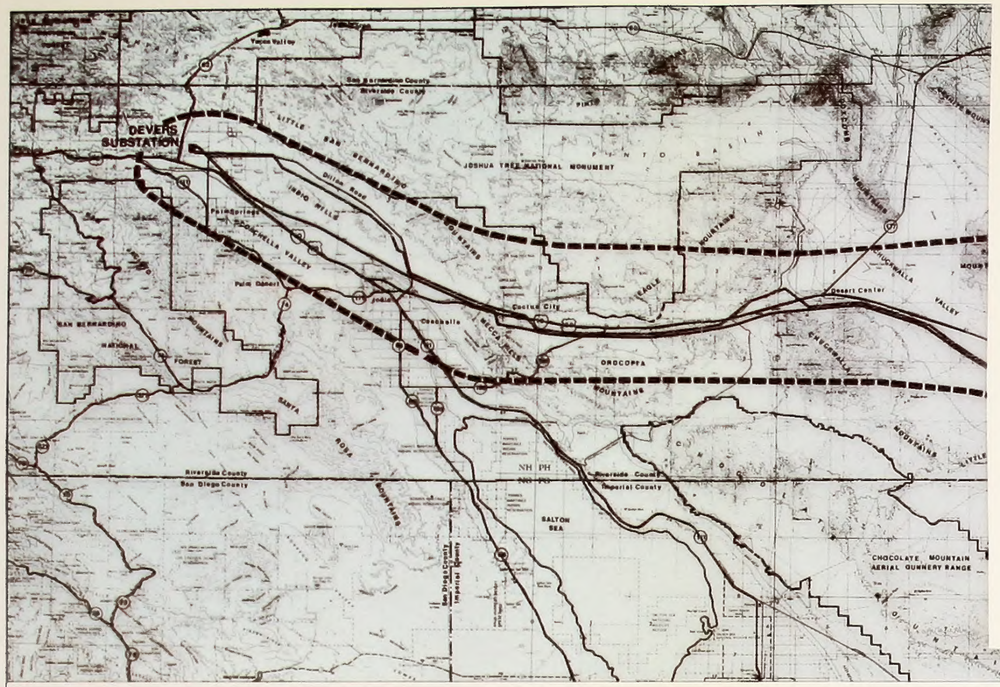
DEPARTMENT OF THE INTERIOR

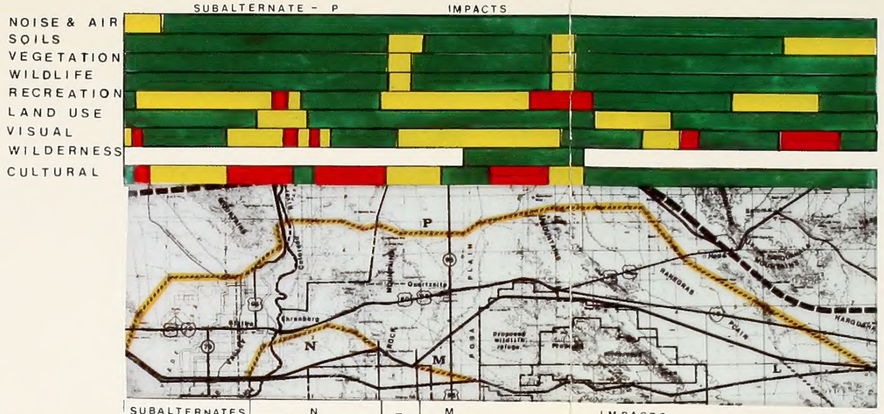
BUREAU OF LAND MANAGEMENT

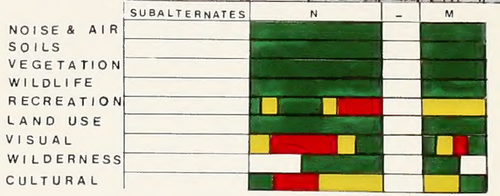
PROPOSED

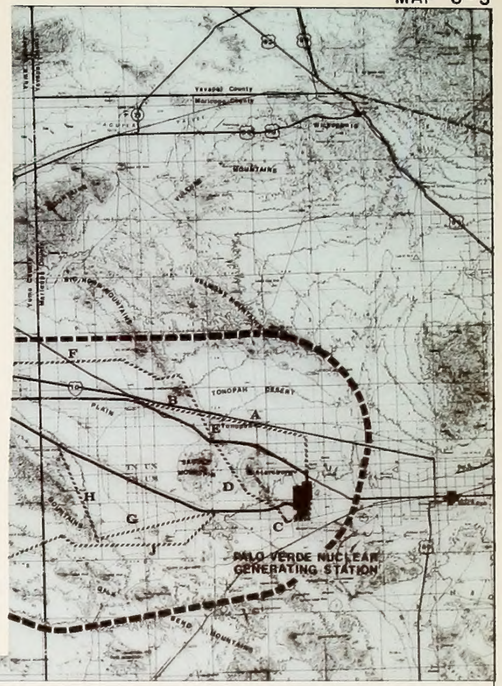
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

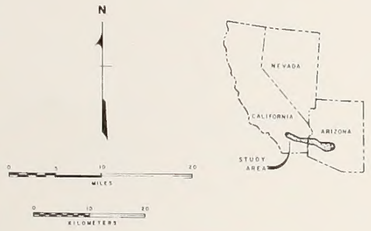
SUMMARY OF IMPACTS ON SUBALTERNATES ABCGH











ROUTES UNDER STUDY

BRENDA

KOFA

SUBALTERNATES A

LEGEND

- SUBALTERNATES
- HIGH
- MEDIUM
- LOW
- NONE

SOURCE: SEE TEXT

UNITED STATES

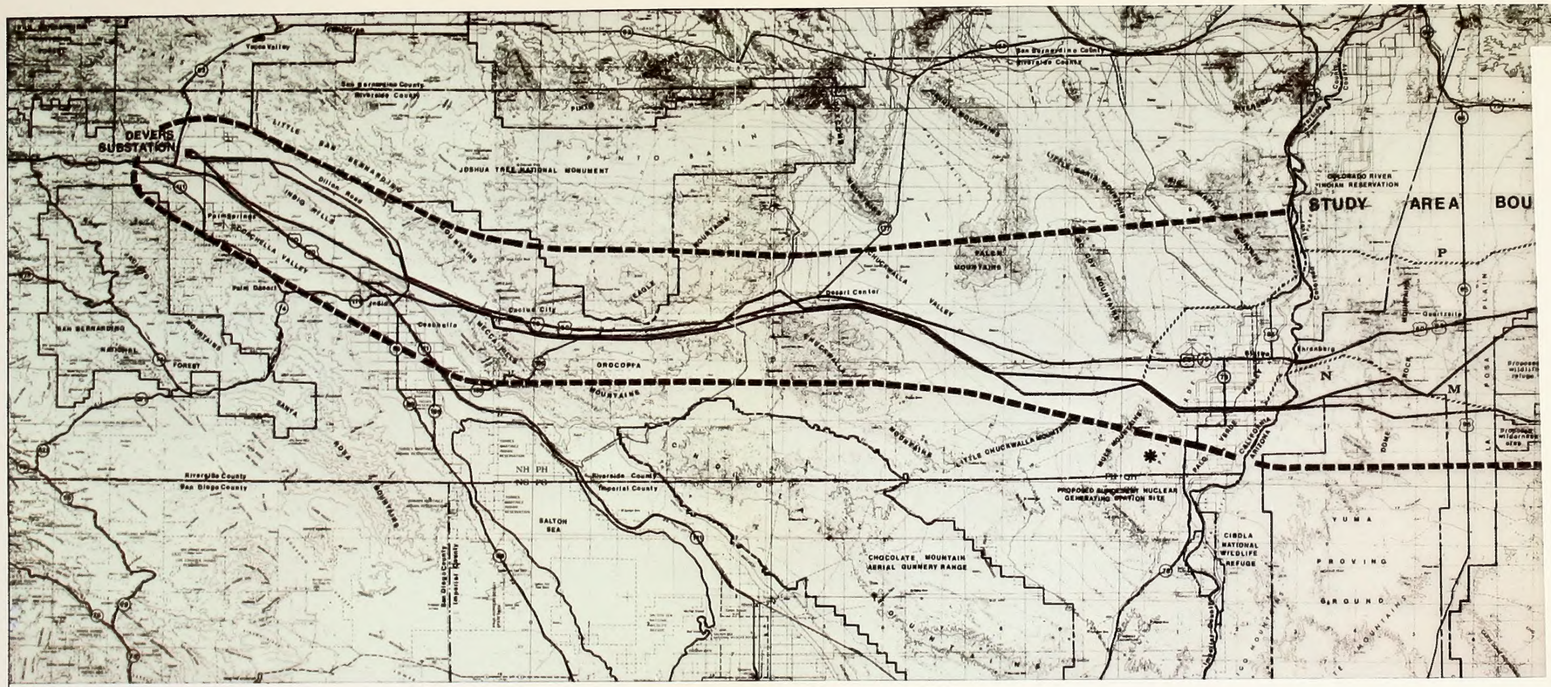
DEPARTMENT OF THE INTERIOR

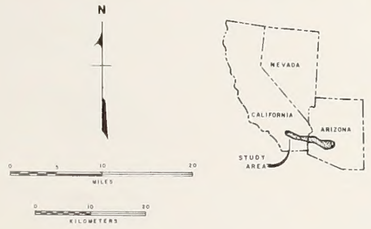
BUREAU OF LAND MANAGEMENT

PROPOSED

PALO VERDE-DEVERS 500KV TRANSMISSION LINE

SUMMARY OF IMPACTS ON SUBALTERNATES MNP



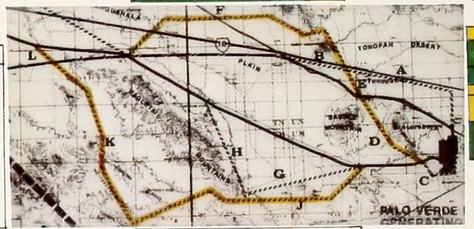


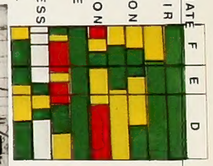
ROUTES UNDER STUDY
BRENDA
KOFA
SUBALTERNATES A

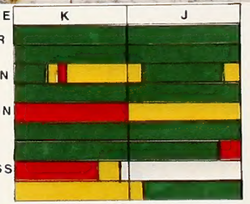
LEGEND

SUBALTERNATES
HIGH
MEDIUM
LOW
NONE

SOURCE: SEE TEXT







UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

PROPOSED
PALO VERDE-DEVERS 500KV TRANSMISSION LINE

SUMMARY OF IMPACTS ON SUBALTERNATES DEFJKL

TABLE 8-1

KNOWN AND PROBABLE ARCHAEOLOGICAL SITE DENSITY
PER 10-MILE UNITS
(For Subalternate Routes)

Alternate Routes

10-Mile Unit	Inventory Status	Known Sites 1-Mile-Wide Corridor	Known Sites 2-Mile-Wide Corridor	Known Site Density	Probable Site Density
Route A					
0-17	Uninventoried	0	0	Very Low	Low
Route B					
0-6	"	0	0	Very Low	Low
Route C					
0-7	"	1	1	Low to Medium	Medium
Route D					
0-10	Spot Check Inventory	3	3	Low	Medium
Route E					
0-4	"	1	1	Low	Same
Route F					
0-6	"	3	4	Low to Medium	Same
6-17	200 Meter Wide Corridor Inventoried	4	4	Low to Medium	Same
17-20	I-10 Inventory (width unknown)	5	7	Low to Medium	Same
Route G					
0-10	Uninventoried	0	0	Very Low	Same
10-15	Spot Check Inventory	2	2	Low	Same
Route H					
0-12	Uninventoried	1	1	Low	Same
Route J					
0-10	"	0	0	Very Low	Low to Medium
10-17	Spot Check Inventory	1	1	Low	Low to Medium
Route K					
0-10	"	1	1	Very Low	Low
10-20	"	2	2	Low	Same
20-31	Uninventoried	0	0	Very Low	Low
Route L					
0-3	"	1	1	Very Low	Same
Route M					
0-7	"	0	0	Very Low	Low
Route N					
0-12	90' Wide Pipeline Inventoried	6	6	Medium to High	High
12-17	Uninventoried	0	0	Very Low	Same
Route P					
0-10	400' Wide Corridor Inventoried	2	3	Low	Same
10-20	"	1	5	Low	Same
20-30	"	1	1	Very Low	Same
30-40	"	2	2	Low to Medium	Same
40-50	"	5	5	Low to High	Same
50-60	"	2	2	Low to High	Same
60-70	Uninventoried	0	0	Very Low	High
70-80	400' Wide Corridor Inventoried	20	20+	High	Same
80-90	"	4	4	Low to Medium	Same
90-96	"	5	7	Low to High	Same

Source: BLM Team

TABLE 8-2

HISTORIC SITES OR AREAS NEAR SUBALTERNATE ROUTES

Known Site Area	2-Mile-Wide Corridor	Study Area, Close to Corridor
Route H		
Double Eagle Mine		X
Route K		
Clanton Well		X
Route N		
La Paz Town Site		X
Ehrenberg Town Site	X	
Route P		
Harquahala Mine and Townsite		X
Desert Wells Stage Station		X
Southern Cross Mine		X
Mudersbach Mine		X
Plomosa Mountain Military Encampment	X	

Source: BLM Team

TABLE 8-3

KNOWN AND PROBABLE CULTURAL RESOURCE SENSITIVITY LEVELS
PER 10-MILE UNITS (OR PORTIONS THEREOF)
(For Subalternate Routes)

H = High M = Medium L = Low N = None ID = Insufficient Data

10-Mile Unit	Portion of 10-Mile Unit	Known Sensitivity	Probable Sensitivity
Route A			
0-17		ID	L
Route B			
0-6		ID	L
Route C			
0-7		ID	M
Route D			
0-10	0-4	ID	L
	4-10	ID	M
Route E			
0-4		ID	L
Route F			
0-10	0-6	ID	M
	6-10	L	L
10-20	10-16	L	L
	16-20	ID	L
20-27		ID	L
Route G			
0-10		ID	L
10-15	10-12	ID	L
	12-15	ID	M
Route H			
0-12	0-3	ID	M
	3-12	ID	L
Route J			
0-10		ID	L
10-17	10-15	ID	L
	13-17	ID	M
Route K			
0-10		ID	M
10-20	10-13	ID	M
	13-18	ID	L
	18-20	ID	M
20-30	20-22	ID	M
	22-30	ID	L
30-31		ID	L
Route L			
0-3		L	L
Route M			
0-7	0-3	L	L
	3-7	M	M
Route N			
0-10	0-8	M	M
	8-10	H	H
10-17	10-12	H	H
	12-17	L	L
Route P			
0-10		L	L
10-20		L	L
20-30		L	L
30-40	30-37	L	L
	37-40	M	M
40-50	40-41	M	M
	41-46	H	H
	46-50	L	L
50-60	50-52	L	L
	52-55	M	H
	55-60	L	H
60-70	60-67	ID	H
	67-70	ID	L
70-80		H	H
80-90		M	M
90-96	90-93	H	H
	93-96	L	L

Source: BLM Team

TABLE 8-4

SUMMARY OF PROJECTED CULTURAL RESOURCE IMPACTS
PER 10-MILE UNITS (OR PORTIONS THEREOF)
(For Subalternate Routes)

H = High M = Medium L = Low N = None

10-Mile Unit	Portion of 10-Mile Unit	Probable Direct Impacts	Probable Indirect Impacts	Summary of Impacts
Route A				
0-10		L	L	L
10-17		L	L	L
Route B				
0-6		L	L	L
Route C				
0-7		M	L	M
Route D				
0-10	0 - 3	L	L	L
	3 - 7	M	M	M
Route E				
0-4		L	L	L
Route F				
0-10	0 - 2	L	L	L
	2 - 6	M	M	M
	6 - 10	L	L	L
10-20		L	L	L
20-27		L	L	L
Route G				
0-10		L	L	L
10-15	10 - 12.5	L	L	L
	12.5- 15	M	M	M
Route H				
0-10	0 - 3	M	L	M
	3 - 7	L	L	L
10-12		L	L	L
Route J				
0-10		L	L	L
10-17	10 - 14	L	L	L
	14 - 17	M	L	M
Route K				
0-10		M	M	M
10-20	10 - 13	M	M	M
	13 - 17	L	L	L
	17 - 20	M	M	M
20-30	20 - 22	M	M	M
	22 - 30	L	L	L
Route L				
0-3		L	L	L
Route M				
0-7	0 - 3	L	L	L
	3 - 7	M	M	M
Route N				
0-10	0 - 8	M	L	M
	8 - 10	H	M	H
10-17	10 - 12	H	M	H
	12 - 17	L	L	L
Route P				
0-10		L	L	L
10-20		L	L	L
20-30		L	L	L
30-40	30 - 37	L	L	L
	37 - 40	M	M	M
40-50	40 - 41	M	M	M
	41 - 47	M	H	H
	47 - 50	L	L	L
50-60	50 - 52	L	L	L
	52 - 60	M	M	M
60-70	60 - 67	H	M	H
	67 - 70	L	L	L
70-80		H	H	H
80-90		M	L	M
90-96	90 - 93	H	H	H
	93 - 96	L	L	L

SUBALTERNATE ROUTE J-K-L

Segments J-L of this route will require new access roads over mostly flat terrain. Segment K has an existing road. Primary impacts will be low. Secondary visual impacts to recreation are expected to be high. Due to remote location visual impacts to residential areas will be low.

Segment K will have a high impact on the Eagletail, Little Horn, and Clanton Well Proposed Wilderness Study Areas (2, 3 and 4). This will result from crossing the edge of the study area as it follows the Arlington-Salome road.

SUBALTERNATE ROUTES D-E-F

Segments D, E and most of F will require new access roads over rough terrain except for part of segment F which parallels the Central Arizona Project.

Resources along this route will be impacted as shown in map 8-4. Improved access roads will result in low to medium secondary impacts to the Saddle Mountain and Burnt Mountain areas. Visual impact will be high where this route crosses highways.

There will be a medium impact (visual) in the west portion of segment D as it passes adjacent to the Saddle Mountain Wilderness Study Area. High impacts (physical intrusion) are anticipated along the north edge of segment F as it passes adjacent to the Big Horn Mountains.

SUBALTERNATE ROUTES A-B

This route follows existing roads through lower bajada areas resulting in low to medium impacts on resources and land use. Visual impacts will be high to medium due to the close proximity to roads and residential areas. See map 8-2.

SUBALTERNATE ROUTE P

This route has relatively less potential for impacts because much of the terrain is flat. Also, the line could follow existing roads through mountainous areas. See map 8-3 for impacts. The Colorado River Indian Tribal Council has refused to allow any surveys or construction through the reservation. Social and economic conditions have been studied on the Colorado River Indian Reservation by Harbridge House consultants. No specific adverse impacts were identified except where the line would interfere with agricultural work. The complete Harbridge House report is on file at the BLM, Yuma District Office.

Cultural resources along this route include:

Two potential register sites or districts within the corridor;
two State Historical Landmarks within 3 miles (4.8 km) of the corridor;
one National Register Site within 2 miles (3.2 km) of the corridor.

Medium impacts (visual) on the Eagletail Mountains Proposed Wilderness Study Area are identified in the area of the pipeline pump station at point "C".

SUBALTERNATE ROUTE C

This route was developed in case it is necessary to exit the east side of the PVNGS and tie into the Brenda Route. It would also provide an alternative to high cultural impacts on the Brenda Route. Resource impacts are generally low due to flat terrain in a remote area, map 8-2.

SUBALTERNATE ROUTE M

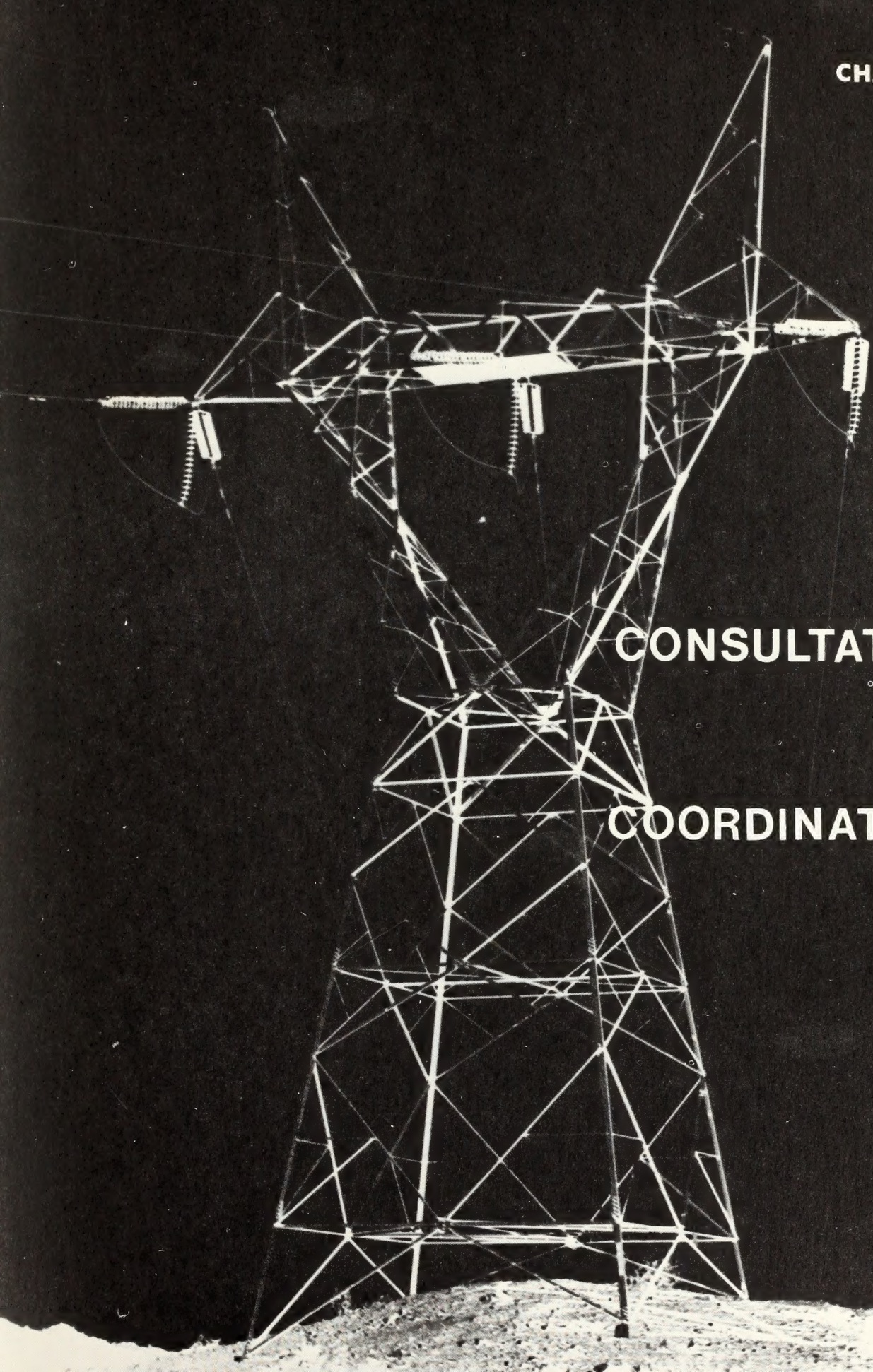
This subalternate segment will allow switching from the Kofa to the Brenda Route. Impacts are mostly low due to the flat terrain and good access over existing pipeline roads. Visual impacts will be high where this route crosses Highway 95. See map 8-3.

SUBALTERNATE ROUTE N

This route follows existing pipeline roads in Arizona, spans the Colorado River and crosses agricultural lands in California. These factors result in medium to high impacts to land use, recreation, visual, wilderness and cultural resources as indicated in map 8-3.

Cultural resources along this segment include one listed State Historic Landmark within 1 mile (1.6 km) of the corridor and one potential landmark or register site within 5 miles (8 km) of the corridor.

CHAPTER 9



CONSULTATION AND COORDINATION

CHAPTER 9

CONSULTATION AND COORDINATION

CONSULTATION AND COORDINATION IN PREPARATION OF THE ENVIRONMENTAL STATEMENT

In preparing the Draft Palo Verde-Devers Environmental Statement the ES team consulted other Federal offices, State and local agencies, interest groups and individuals. Communications ranged from formal written comment to informal personal contact. The first letter was sent out September 20, 1977, and asked for general comments on the proposed project. On January 6, 1978, another letter was sent to government agencies asking that mitigation measures for transmission line impacts be identified.

A third mailing in February, 1978, advised interested groups and individuals of the necessity for input, through public meetings on wilderness area considerations in the Palo Verde-Devers study area. The meetings were held March 1, 2 in San Diego and Indio, California, and March 7, 8, 9 in Phoenix, Harquahala Valley and Yuma, Arizona, respectively. Approximately 80 persons attended the California meetings, and 150 attended meetings in Arizona.

Information concerning the proposed project, the BLM role in the project and the public meetings was published and aired by local news media.

Upon publication of the DES, interested agencies, organizations and individuals were sent copies of the document. The BLM compiled an extensive mailing list as a result of public and intergovernmental responses during preparation of the draft. Clearinghouses and public libraries in the two states were provided appropriate copies. Copies were also on file in Arizona and Southern California BLM offices for public review.

AGENCIES AND INTEREST GROUPS CONTACTED

COORDINATION IN THE REVIEW OF THE ENVIRONMENTAL STATEMENT

Comments on the Environmental Statement were invited from the following agencies and interest groups.

FEDERAL

Environmental Protection Agency

Federal Communications Commission

U.S. Coast Guard

U.S. Department of Agriculture
- Forest Service
  - Angeles National Forest
  - Cleveland National Forest
  - Inyo National Forest
  - Los Padres National Forest
  - San Bernardino National Forest
- Soil Conservation Service

U.S. Department of the Army
- Corps of Engineers
- Yuma Proving Ground

U.S. Department of Energy
- Western Area Power Administration

U.S. Department of the Interior
- Bureau of Indian Affairs
- Bureau of Mines
- Bureau of Reclamation
- Fish and Wildlife Service
- Geological Survey
- Heritage Conservation and Recreation Service
- National Park Service

U.S. Department of Transportation
- Federal Aviation Administration
- Federal Highway Administration

U.S. Nuclear Regulatory Commission

STATE

Arizona

Commission of Agriculture and Horticulture
Corporation Commission
Department of Mineral Resources
Department of Revenue
Department of Transportation
Governor's Commission on Arizona Environment
Natural Resource Conservation District
Office of Economic Planning and Development
Outdoor Recreation Coordinating Commission
State Clearinghouse
State Game and Fish Department
State Health Department
State Historical Society
State Land Department
State Museum
State Parks Department

California

Air Resources Board
CALTRANS
Department of Conservation
Department of Water Resources
Division of Highways
Division of Mines and Geology
Energy Resources Conservation and Development Commission
Land Commission
Public Utilities Commission
Regional Water Quality Control
South Coast Air Quality Management District
State Clearinghouse
State Energy Commission
State Fish and Game Department
State Health Department
State Historical Preservation
State Parks and Recreation
Wildlife Federation Board

COUNTY

Imperial

Board of Supervisors
Planning Commission

COUNTY (Cont'd)

Orange

Board of Supervisors
Planning Commission

Maricopa

Association of Governments
Board of Supervisors
Flood Control District
Highway Department
Parks and Recreation Department
Planning Department

Riverside

Board of Supervisors
Planning Director

San Bernardino

Association of Governments
Board of Supervisors
Environmental Improvement Agency
Regional Parks Department

San Diego

Department of Land Use and Environmental Regulations

INTEREST GROUPS

Advisory Commission on Arizona Environment
Agricultural Stabilization and Conservation Service, Indio, CA
Agua Caliente Tribal Council
American Camping Association
Anamax Mining Company
Arizona Horticultural Aircraft Association
Arizona Association of Conservation Districts
Arizona Cattle Growers' Association
Arizona Conservation Council
Arizona Desert Bighorn Sheep Society
Arizona Farm Bureau Federation
Arizona Mining Association
Arizona Public Service Company

INTEREST GROUPS (Cont'd)

Arizona Small Mine Operators Association
Arizona Roadside Council
Arizona State Association of 4-Wheel Drive Clubs
Arizona State AFL-CIO
Arizona State 4-Wheel Drive Association
Arizona Trails Association
Arizona Treasure Hunters
Arizona Varmint Callers Association
Arizona Wildlife Federation
Audubon Society, Yuma, Arizona
Banning Sportsman's Club
Brookhaven National Laboratory
Burch, Cracchiolo, Levie, Guyer & Weyl, P.A.
Cactus and Succulent Society, San Marino, California
California Historical Landmarks Advisory Committee
California Outdoor Recreation League
California Wildlife Federation
Camp Research - PCT
Canyon Country Council
Cities Service Minerals Corp.
Coachella City Manager
Coachella Valley Association of Governments
Coachella Valley Wild Game Propagation Club
College of the Desert
Colorado River Indian Tribal Council
CONOCO
Conservation Call
Creepy Crawlers 4-Wheel Drive Club
Desert Hot Springs City Manager
Desert Protective Council, Banning, California
Desert Protective Council, Indio, California
Desert Protective Council, Palm Springs, California
Desert Protective Council, West Covina, California
El Dorado Audubon Society
El Paso Natural Gas Company
Environmental Clearinghouse, Phoenix, Arizona
Environmental Conscience, Inc.
Friends of the Earth
Harquahala Valley Environmental Association
Henningson, Durham & Richardson
HIDES Environmental Defense Fund
Indio, Mayor, City of
Inland Conservation News
Inland Fish and Game Conservation Association
Isaac Walton League, California Division
League of Arizona Cities and Towns

INTEREST GROUPS (Cont'd)

Living Desert Reserve (The)
Los Angeles Audubon Society
Los Angeles Department of Water and Power
Maricopa Audubon Society
Maricopa Family Camper
Maricopa Lapidary Society
Morongo Basin Conservation Association
National Association of Conservation Districts
National Campers and Hikers Association
National Parks and Conservation Association
National Wildlife Federation
National Resource Defense Council
North Shore, Department of Parks and Recreation
Oil and Gas Association of Arizona
Palm Springs, Mayor, City of
Palo Verde-Devers Study Committee of the Harquahala Ranches
Palo Verde Valley Rod and Gun Club
Pennsylvania Power and Light Company
Phoenix Sportsmen's Association
Pomona Valley Rod and Gun Club
Power Line Committee of Harquahala Valley
Reno District Geothermal Advisor
Resources Technology Corporation
Road and Trail Association
Safari Club International
Salt River Project
San Diego Gas and Electric Company
SCAG
Sierra Club, Phoenix, Arizona
Sierra Club, Riverside, California
Sierra Club, San Diego, California
Sierra Club, Santa Fe, New Mexico
Southern Arizona Environmental Council
Southern Arizona Hiking Club
Southern Arizona Wildlife Caller
Southern Council of Conservation Clubs, Rosemead, California
Tonopah Valley Association
Twenty-Nine Palms Park and Recreation District
University of Arizona:
    Arizona Agricultural Experiment Station
    Arizona Bureau of Mines
    Department of Soils, Water and Engineering
    Department of Watershed Management
    Wildlife Society, Environmental Quality Committee
Union Minerals
University of California, Office of Technical Information, Air Pollution Control

INTEREST GROUPS (Cont'd)

Western Rockhound Association, Inc.
Western Sportsman's Club
Whittier Audubon Society
Wilderness Society (The)
Wilderness Society, Glenwood, New Mexico
Wildlife Management Institute
Wildlife Society, Arizona Chapter (The)
Yuma, Mayor, City of
Yuma Telco Rod and Gun Club
Yuma Valley Rod and Gun Club
Yuma Women's Reel and Rifle

Interested Individuals

LEGISLATORS, ARIZONA AND CALIFORNIA

Senator Lela Alston
Senator Trudy Camping
Senator Leo Corbet
Senator Alfredo Gutierrez
Senator Timothy D. Hayes
Senator Anne Lindeman
Senator James A. Mack
Senator Rod McMullin
Senator Jones Osborn
Senator Manuel "Lito" Pena, Jr.
Senator John C. Pritzlaff, Jr.
Senator Ray Rottas
Senator S. J. Hal Runyan
Senator Jack J. Taylor
Senator Stan Turley
Senator Robert B. Usdane
Senator Alan Cranston
Senator S. I. Hayakawa
Senator Marcia Weeks
Senator Dennis D. DeConcini
Senator Robert B. Presley
Senator John Stull
Senator Goldwater's Office
Representative Stan Akers
Representative Burton S. Barr
Representative Elwood W. Bradford
Representative Donna J. Carlson
Representative Jim Cooper
Representative Pete Corpstein

LEGISLATORS, ARIZONA AND CALIFORNIA

Representative Pete Dunn
Representative J. Herbert Everett
Representative Dick Flynn
Representative Art H. Hamilton
Representative Juanita Harelson
Representative Cal Holman
Representative Keith W. Hubbard
Representative Lillian Jordan
Representative Peter Kay
Representative Frank Kelley
Representative George E. Brown
Representative Clair Burgener
Representative Shirley Pettis
Representative Diane B. McCarthy
Representative Gerald F. Moore
Representative Jim Phillips
Representative James Ratliff
Representative William E. Rigel
Representative Elizabeth Adams Rockwell
Representative Jim Skelly
Representative Jacque Steiner
Representative Don Stewart
Representative Leon Thompson
Representative Tony West
Representative Earl Wilcox
Representative James A. Woodward
Representative Pat Wright
Representative Tony Abril
Representative Carl J. Kunasek
Representative Bill Lewis
Representative Manuel G. Marin
Congressman Eldon Rudd
Congressman Robert Stump
Office of Congressman Udall
Office of Congressman Rhodes
Assemblyman Larry Chimbole
Assemblyman Walter Ingalls
Assemblyman Tom Suitt
Honorable Bruce Babbitt, Governor of Arizona
Honorable Edmund G. Brown, Jr., Governor of California

The following are copies of selected correspondence received prior to publication of the Draft Environmental Statement.

MARICOPA COUNTY HIGHWAY DEPARTMENT

3325 WEST DURANGO STREET PHOENIX, ARIZONA 85009

R. C. ESTERBROOKS, P.E.
COUNTY ENGINEER

F. H. LATHROP, P.E.
DEPUTY COUNTY ENGINEER

January 12, 1978

United States Department of Interior
Bureau of Reclamation
Yuma District Office
P. O. Box 5680
Yuma, Arizona 85364

Attention Mr. Karl L. Kipping

Gentlemen:

Re: Environmental Statement on Southern California Edison Co. Proposal to Construct Powerline.

This will acknowledge receipt of your letter of January 6, 1978 and accompanying map showing proposed alternate routes for Southern California Edison 500 KV powerline.

As we have previously stated, none of the proposed routes are in conflict with any proposed projects of Maricopa County Highway Department so long as no part of any tower is closer than 55 feet to any section line which now is or may become a major highway.

Very truly yours,

R. C. ESTERBROOKS, P.E.
ASSISTANT COUNTY MANAGER
AND COUNTY ENGINEER

F. H. Lathrop, P.E.
Deputy County Engineer

FHL:ya

cc: Charles W. Miller

ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

206 South Seventeenth Avenue Phoenix, Arizona 85007

WESLEY BOLIN
Governor

WILLIAM A. ORDWAY
Director

OSCAR T. LYON, JR.
Assistant Director
and State Engineer

February 1, 1978

Mr. Karl L. Kipping
Project Manager
Palo Verde-Devers ES Team
Bureau of Land Management
Yuma District Office
P.O. Box 5680
Yuma, Arizona 85364

Re: Proposed 500 kV Transmission Line from Palo Verde Nuclear Generating Station to Edison's Devers Substation

Dear Mr. Kipping:

In response to your letter of January 6, 1978 the Environmental Planning Services and Utility and Railroad Engineering Services of the Arizona Department of Transportation, Highways Division, have reviewed your proposal for routing the above referenced transmission line through Arizona and California.

The current Arizona Department of Transportation Five Year Transportation Construction Program contains no highway construction projects in the area of the proposed transmission line route alternatives.

Since the proposed route or the alternate routes would cross Interstate 10, U.S. Highway 95 or U.S. Highway 60, highway right of way encroachments will be required. Your contact for necessary permits and plans coordination would be Mr. Milem C. Livesay, District I Engineer, Arizona Department of Transportation, 2140 West Hilton Avenue, Phoenix, Arizona 85007.

It is preferred the transmission towers be located no closer than 200 feet from the roadway which is the normal right of way width. This permits future maintenance and upgrading or improving highways without disturbing utility transmission lines. It should be noted that I-10 is a controlled access highway which would restrict points of access to maintenance roads

along the transmission line. It would be preferable if an alignment is selected for the transmission line which will pose the least adverse visual impact on the highway motorists.

We appreciate the opportunity to review and comment on this proposal and if we may be of further assistance, please let us know.

Yours very truly,

OSCAR T. LYON, JR.
State Engineer

James E. Dorre

JAMES E. DORRE, Manager
Environmental Planning Services

JED:ADG:cls

cc: Utilities and Railroad Engineering
District I

RIVERSIDE COUNTY PLANNING DEPARTMENT

PLANNING COMMISSION
ELMER M. KATZENSTEIN, Chairman, Rubidoux

KAY S. CENICEROS, Hemet
JESS E. LILLIBRIDGE, Corona
KAY H. OLESEN, Palm Desert
DAVID W. TER BEST, Calimesa
RUSSELL E. CAMPBELL, Blythe
MARION V. ASHLEY, Perris

JAR:94731

JAMES L. WHITE – ACTING PLANNING DIRECTOR

4080 LEMON STREET, 9th FLOOR, RIVERSIDE, CALIFORNIA 92501
TELEPHONE (714) 787-6181

February 7, 1978

United States Department of the Interior
Bureau of Land Management
Yuma District Office
P.O. Box 5680
Yuma, AZ 85364

Attn: Karl L. Kipping, Project Manager

Dear Mr. Kipping:

Reference is made to your letter of January 6, 1978 (A-9878), requesting recommendations on mitigating measures for the Palo Verde-Devers Electrical transmission facility.

Due to an increasing caseload, and other circumstances beyond our control, we were unable to devote the time necessary to comply with your request. However, we are concerned with the routing of the lines, and wish to comment on the Environmental Statement when it is available.

Very truly yours,

RIVERSIDE COUNTY PLANNING DEPARTMENT

James L. White, Acting Planning Director

JLW/rws

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WESTERN REGION
P O BOX 92007, WORLDWAY POSTAL CENTER
LOS ANGELES CALIFORNIA 90009

January 11, 1978

In Reply
Refer To: 78-AWE-5-OE

Mr. Carl Kipping
Project Manager
United States Department of the Interior
Bureau of Land Management
P. O. Box 5680
Yuma, Arizona 85364

Reference: BLM letter A-9878 dated January 6, 1978

Dear Mr. Kipping:

We have reviewed the various power transmission line routes between the Palo Verde Generating Station and the Devers Substation near Blythe, California at the request of Southern California Edison Company.

We recommend to SCE that from an aeronautical safety standpoint sub alternate routes S-21 and S-22 are preferrable.

Since all of the transmission line support towers will be less than 200' above ground level, we have not recommended that they be lighted or marked.

Please direct any questions concerning this project to Elly Stanson at FTS - 966-6180.

Sincerely,

DON M. DAVIS
Chief, Airspace and Procedures Branch
Air Traffic Division

ADDRESS ALL COMMUNICATIONS
TO THE COMMISSION
CALIFORNIA STATE BUILDING
SAN FRANCISCO, CALIFORNIA 94
TELEPHONE: (415) 557- 1574

Public Utilities Commission

STATE OF CALIFORNIA

January 11, 1978

FILE NO A-57251

Mr. Karl L. Kipping, Project Manager
Bureau of Land Management
Yuma District Office
P. O. Box 5680
Yuma, Arizona 83564

Dear Mr. Kipping:

SOUTHERN CALIFORNIA EDISON COMPANY, PALO VERDE TO DEVERS 500-KV TRANSMISSION LINE

In your letter of January 6 to Mr. Samo of this office, you stated that in connection with your preparation of the Federal Environmental Statement for the subject project you need to know the mitigation measures that will be required on lands the transmission line will cross that are under the jurisdiction of this agency.

The California Public Utilities Commission has before it an application requesting certification of public convenience and necessity for the subject project. As certifying entity for the State of California, this agency is the lead agency for the preparation of an Environmental Impact Report (EIR) in conformance with the California Environmental Act of 1970 (CEQA). We are at the present time preparing a draft of that report. Required mitigation measures have not as yet been determined.

State procedures encourage the use of environmental assessments prepared by federal agencies for such as the subject project when reasonable. Because of the applicant's need to have project approval within a specific time in order to take delivery of power from the Palo Verde generation plant now under construction, we have agreed to the applicant's request to proceed with the environmental assessment required under CEQA concurrently with the assessment you are preparing for federal requirements.

Under our procedures for environmental assessment and certification, required mitigation measures will not be finally ascertained until a decision is rendered by the Commission. Following issuance of the draft EIR and receipt of comments on the document, an adjudicatory hearing will be held encompassing not only the environmental aspects

of the project but also the certification requirements as well. A final EIR will then be prepared and the decision of the Commission rendered.

The draft EIR is being structured to make extensive use of the work of other agencies, particularly BLM. Emphasis of the report will be to state and local concerns. Required mitigation measures will be reasonable and in concert with those required by your agency.

Further work on the draft EIR is limited pending receipt of additional information requested of the applicant. In the event this information is not received in a timely manner, we have the option of adopting the environmental assessment prepared by your agency with appropriate additions and supplementing by our staff as necessary to fulfill the requirements of CEQA.

We regret we cannot be more specific in answer to your request; however, we trust that our response has given you an understanding of how we will attend to the matter of required mitigating measures for this project. If we can be of further assistance, please do not hesitate to contact R. Penny or C. Samo at (415) 557-1574.

Very truly yours,

D. B. Steger
Chief Environmental Engineer

cc: Southern California Edison Company
P. O. Box 800
Rosemead, California 91770
Attention: Mr. Earl Sample, Manager of Regulatory Costs

STATE OF CALIFORNIA
EDMUND G. BROWN JR., Gove

STATE LANDS COMMISSION
EXECUTIVE OFFICE

1807 13TH ST
SACRAMENTO, CALIFORNIA 9

January 30, 1978

Bureau of Land Management
Yuma District Office
P.O. Box 5680
Yuma, Arizona 85364

Attention: Mr. Karl L. Kipping
Project Manager

Dear Mr. Kipping:

This is in response to your letter regarding the pending Federal Environmental Statement on the proposed Southern California Edison powerline from the Palo Verde Nuclear Generating Station to their Dever's Substation. The routes shown on your transmittal map will cross several parcels of land which are under the jurisdiction of the State Lands Commission.

Several of these parcels, including the Colorado River crossing, have been identified as possessing significant environmental values of statewide concern pursuant to existing State law. For example, the proposed Colorado River crossing has scenic, wilderness and recreation values attributed to it. In this regard, we have some difficulty responding to your request since the information provided on the project is not of sufficient detail to determine the effect of this proposal on such lands. For example, where are the necessary supports to be placed, what width of right-of-way is required and what will be needed through such rights-of-way (access roads, etc.), how will the wires be strung, etc. Without details such as these, it is difficult to suggest mitigation measures for environmental factors of unknown nature and scope.

It would be most helpful if you or the applicant could supply the staff of the State Lands Commission with sufficient detail on this project to enable us to respond in this matter. Of course, we would also encourage Southern California Edison to apply to the Commission as soon as possible for the necessary rights-of-way, etc.

Please advise if we can be of any help in this regard.

Sincerely,

WILLIAM F. NORTHROP
Executive Officer

cc: J. F. Trout

El Paso NATURAL GAS COMPANY

P. O. BOX 1492
EL PASO, TEXAS 79978

PHONE: 915-543-2600

February 8, 1978

Mr. Karl L. Kipping
Project Manager
Palo Verde-Devers ES Team
Bureau of Land Management
Yuma District Office
P. O. Box 5680
Yuma, Arizona 85364

Dear Mr. Kipping:

In response to your letter of January 6, 1978 (A-9878) concerning mitigating measures to protect the pipeline we have the following comments:

1. Specific locations cannot be cited for protection since no transmission line profile maps are available.

2. A testing program should be initiated to obtain a pipeline voltage profile both before and after the line is energized. This will indicate areas where induced AC is above the safe level of 30V.

3. Tower grounding systems should be at least 100' from the cathodic protection ground bed on our pipelines.

4. The power line should avoid crossing the pipeline in areas where the pipeline is exposed or there are above grade appurtenances.

5. Maximum separation distances should be maintained between transmission line and pipeline to minimize interference effects. A minimum distance of 500' however, should minimize this effect in most cases to the point where no mitigation measures will be required.

6. The Kirk grounding cell is one type of device which is used to reduce potentials on pipelines. This cell is connected between the pipeline and ground, where it allows a high impedance at low impressed voltage and lower impedance with larger impressed voltages. This feature is necessary to allow proper cathodic protection while providing grounding for large potentials. This device has been successfully used on other pipelines.

7. Another type of device is a magnesium or zink ribbon buried parallel to the pipeline and electrically connected to it. The ribbon can also be used to construct ground mats to prevent hazards at above ground facilities. This method is effective in maintaining cathodic protection while providing grounding for larger potentials.

As you are aware, there are other mitigation measures presently under study. These may be considered for pipeline protection in the future after they have proven their reliability and effectiveness.

If you have any questions please call at (915) 543-4925.

Sincerely yours,

James R. Hoffman

'hbr

c: D. N. Bigbie
L. A. Henton, Southern California Edison Company

United States Department of the Interior

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY
REFER TO: LC-420
652.

Your reference:
A-9878

JAN 25 BM

Mr. Karl L. Kipping, Project Manager
Palo Verde-Devers ES Team
Yuma District Office
Bureau of Land Management
P. O. Box 5680
Yuma, Arizona 85364

Dear Mr. Kipping:

We have reviewed the proposed and alternative routes for the future Palo Verde-Devers 500-kV powerline as submitted by your letter of January 6, 1978, and determined that all routes will cross only a minimum of Reclamation lands usually where the lines intersect the Colorado River.

In answer to your question concerning mitigation, there are no special mitigation measures that this Bureau believes should be required for the proposed powerline. The only concerns Reclamation has are for the implementation of standard erosion control practices during construction and for the visual resources of the impacted area to be assessed before site selection especially near the Colorado River for individual powerline towers is determined. The methods currently utilized by the Bureau of Land Management for erosion control and visual resources management are sufficient to meet our responsibilities.

Sincerely,

Manuel Lopez, Jr.
Regional Director

In duplicate

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

DEPARTMENT OF THE ARMY
UNITED STATES ARMY YUMA PROVING GROUND
YUMA, ARIZONA 85364

STEYP-FEP

10 MAR 1978

Mr. Karl L. Kipping
Project Manager
Palo Verde-Devers ES Team
Yuma District Office
Bureau of Land Management
P.O. Box 5680
Yuma, AZ 85364

Dear Sir:

This is in response to your letter of 6 January 1978, which requested mitigating measures from this installation regarding the proposed routing of the Southern California Edison Company 500 KV powerline through Yuma Proving Ground.

As you are aware, Yuma Proving Ground recently submitted a position paper to the Arizona Corporation Commission which outlined military future development plans programmed for the Weaver Pass area. It also addressed the incompatibility of land use between the proposed military test facility and the proposed powerline within the area.

In view of the incompatibility of the two proposals, Yuma Proving Ground withdraws any consideration of allowing the powerline to be routed through its property. Therefore, no mitigating measures are being furnished.

A copy of the position paper submitted to the Arizona Corporation Commission is inclosed.

If you have any questions concerning this position, please direct them to Mr. R.G. Smith, phone number 328-2224.

Sincerely,

Ernest E. Beach

ERNEST E. BEACH
Colonal, QM
Commanding

1 Inclosure
Ltr to AZ Corp Com

CF:
Commander, TECOM, ATTN: DRSTE-LG-F

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
COLORADO RIVER AGENCY
Route 1, Box 9-C
Parker, Arizona 85344

IN REPLY REFER TO:
602-669-2159
Real Prop. Mgmt.

January 20, 1978

Mr. Karl L. Kipping, Project Manager
Bureau of Land Management
Yuma District Office
P.O. Box 5680
Yuma, CA 85364

Dear Mr. Kipping:

This is in reply to your letter of January 6, 1978, regarding Southern California Edison Company's proposal to construct a 500 KV powerline from the Palo Verde Nuclear Generating Station to Southern California Edison's Devers Substation.

The proposal from Southern California Edison was presented to the Colorado River Tribal Council at their regular scheduled meeting on November 13, 1976 for consideration.

The Tribal Council took formal action to disapprove the request for a survey to be made on the reservation by Southern California Edison Company. The Tribes are not interested in having a power line corridor across the southern part of their reservation.

On January 28, 1977, the Tribal Chairman directed a letter to Bureau of Land Management, Phoenix, Arizona citing the Tribal Council Action of November 13, 1976 (copy attached for your reference).

On March 3, 1977 the Tribal Chairman also sent a letter to Southern California Edison Company stating their objections (copy of letter attached for your reference).

We trust the above information will answer your inquiry.

Sincerely yours,

William J. Somerlott
Superintendent

Enclosures

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

P.O. Box 1032
Yuma, Arizona 85364

January 10, 1978

Mr. Karl L. Kipping
Bureau of Land Management
P.O. Box 5680
Yuma, Arizona 85364

Dear Mr. Kipping:

In response to your January 6 letter regarding the Powerline, our position is that the line is incompatible with Refuge Objectives and not an allowable development.

We are not at the point of determining mitigation because we do not visualize that the right-of-way will be granted.

Our proposal to transfer certain lands to the Bureau of Land Management in a trade-off was a compromise that would have resolved the problem. As it stands now, it would be inappropriate to formulate any mitigative measures for the Kofa Game Range. As for lands off the Game Range, contact our Ecological Services Division in Phoenix for any recommendations.

In reviewing the map you enclosed it is interesting to note that all routes circumvent the Joshua Tree National Monument in California. Kofa asthetic values are equally regarded.

Sincerely,

Monte M. Dodson
Refuge Manager

PUBLIC COMMENTS ON THE DRAFT ES

The Draft Environmental Statement (DES No. 78-34) was filed with the Environmental Protection Agency on August 21, 1978, and released to the public. The notice of availability was published in the August 22, 1978, issue of the Federal Register. The notice provided for a review period of 45 days subsequent to the date of the notice. The review period was extended until October 20, 1978, after formal public hearings were held. News releases were issued by the Department of Interior, Washington, D.C. and by the BLM Arizona State Office to publicize the availability of the draft ES.

PUBLIC HEARINGS

Three public hearings were held on the draft ES. They were announced in the Federal Register notice of August 22, 1978, and were publicized in Arizona and California through news releases from the BLM Arizona State Office. An Interior Department Administrative Law Judge presided over the hearings, which were recorded verbatim by a professional Court Reporter. The hearing panel was comprised of BLM staff.

Hearing locations, dates and times, attendance and the number of persons testifying are as follows:

Location	Time and Dates	Attendance	Number Testifying
Phoenix	7:30 p.m. September 26, 1978	34	11
Blythe	7:30 p.m. September 27, 1978	13	1
Indio	7:30 p.m. September 28, 1978	11	0

HANDLING OF PUBLIC COMMENTS AND REVIEW PROCEDURES

All written comments and hearing transcripts have been sent to the Secretary of the Interior. Facsimilies are available for inspection at the BLM Arizona State Office, Phoenix and at BLM Yuma District Office, Yuma, Arizona.

BLM staff members reviewed and considered individually each written and oral comment. The staff responded to and made appropriate text changes for comments that presented new data, questioned facts or analyses, or raised questions or issues bearing directly upon environmental effects of the proposal and alternatives. No response was made to comments or recommendations that did not address the adequacy of the draft ES. Hearing comments requiring response are taken directly from hearing transcripts.

Although the public review period ended October 20, 1978, comments received since that date were addressed until the final ES was ready to go to press.

INDIVIDUAL COMMENTS AT PUBLIC HEARINGS

September 26, 1978 -- Phoenix, Arizona

Speaker (Representing)

Ed Shannahan (Arizona Bighorn Sheep Society)

1. Comment: "...but I could not find any statements concerning possibly using helicopters to construct some of the power line in some of these (bighorn sheep habitat) mountain areas."

   Response: Mitigating measures for impacts on desert bighorn sheep are described under General Mitigation Measures in chapter 1 and again in the Wildlife section and MONITORING AND RESEARCH PROGRAMS in chapter 4.

   Helicopter construction is listed in several places in chapter 4 as an alternate construction technique.

Speaker (Representing)

Mrs. Heisler (Tonopah Valley Association)

2. Comment: "This BLM Environmental Statement Draft has seemingly ignored our voiced opinions, both written and oral as to the detriment of any more impact to our area by power lines."

   Response: The ES has been written to assess impacts of the applicant's proposal and viable alternatives. Opinions expressed through public comment and review procedures did receive consideration and become part of the record.

   (NOTE: Mrs. Heisler also submitted written comments, virtually identical to her oral comments. They are reproduced in the Written Comment Section.)

September 27, 1978 -- Blythe, California

Robert Dingham (Self)

3. Comment: "There was a study done by a man named Andrew Marino of the Veterans Administration. According to his study, directly underneath the powerline there is a stunting

of growth in animals, and that 300-500 feet from the powerline there are changes in blood chemistry and the electrocardiogram in people, apparently, is altered."

"And, that a thousand feet from the line, there are behavioral changes, that reaction time slows."

"His critics in this article do not even contest the fact that there are problems. They attribute the problems to heat, the effects caused by heat."

"I mean, I don't care if the effects are caused by heat, electromagnetic fields or radiation or what not if, in fact, there are effects being caused. I haven't seen any mention of that at all as to what are these effects and how bad they are, and has anybody checked this out?"

Response: A legal precedent has been set on alleged health and safety effects of high voltage transmission lines. In Woida v. U.S., March 10, 1978, U.S. District Court, District of Minnesota, Fourth Division, it was ruled that the Rural Electrification Administration National Environmental Policy Act environmental statement on a proposed power plant transmission line project was not required to analyze alleged health and safety effects because that agency "made reasonable determination, supported by the great weight of scientific evidence, that lines have no such effect."

On the plaintiffs' motion for preliminary injunction the motion was denied.

The following quotation is taken from "Environment Reporter Decisions, No. 18," dated May 5, 1978, published by the Bureau of National Affairs, Inc.

HEALTH & SAFETY FACTORS

"The plaintiffs also challenge the adequacy of the final EIS on the ground that it fails to analyze certain potential effects on health and safety associated with the electrostatic and electromagnetic fields to be created by a $\pm$ 400 kV dc HVTL. It is undisputed that the transmission of electricity through a HVTL creates electrostatic and electromagnetic fields around the line. However, the record is devoid of competent evidence that the fields surrounding the $\pm$ 400 kV dc HVTL will pose any real danger to human health and safety or to the environment."

A copy of "Environment Reporter Decisions" is on file in the BLM Yuma District Office. Also on file are copies of an article from the July 17 issue of Newsweek Magazine entitled "The Flap Over The Zap," and an article from the December, 1974, issue of The Bulletin of the Atomic Scientists called "Pollution by Electrical Transmission" by Louise B. Young and H. Peyton Young.

WRITTEN COMMENTS AND RESPONSES

This section includes all written comments on the draft ES received, and BLM responses where appropriate. There is also a copy of a set of petitions circulated by The Tonopah Valley Association. The petitions were submitted to the BLM Arizona State Office and are on file. There were 907 petitions bearing 1,508 signatures.

TONOPAH VALLEY ASSOCIATION
P. O. BOX 103
TONOPAH VALLEY, ARIZONA 85354

I (We), as property owner(s) or resident(s) in the Tonopah Valley area, am (are) against any transmission power lines crossing our Tonopah Valley area. I (We) feel that the Southerly routes from the Palo Verde Nuclear Generating Plant, near Wintersburg, Arizona, going directly West to the California site near Palm Springs (which would run South of the Eagletail Mountains in Harquahala Valley, Arizona) would be the best routes to be constructed.

Dated: 10-21-77

Names: W. Rodney Heiden

Address: 711 HAZZAMORE AVE.
BUCKEYE, ARIZ. 85326

TONOPAH VALLEY ASSOCIATION
P. O. BOX 103
TONOPAH VALLEY, ARIZONA 85354

I (We), as property owner(s) or resident(s) in the Tonopah Valley area, am (are) against any transmission power lines crossing our Tonopah Valley area. I (We) feel that the Southerly routes from the Palo Verde Nuclear Generating Plant, near Wintersburg, Arizona, going directly West to the California site near Palm Springs (which would run South of the Eagletail Mountains in Harquahala Valley, Arizona) would be the best routes to be constructed.

Dated: Oct 14, 1977

Names: Bess C. Nuzzo
Vincent Nuzzo

Address: c/o C. Furia
375 Mt. Prospect Ave
NEWARK, N.J. 07104

1

Aug. 29, 1978
2621 Virginia Dr., #221
Yuma, Ariz. 85364

RECEIVED
B.L.M. AZ STATE OFFICE

AUG 3 0 1978

10:00 A.M.
PHOENIX, ARIZONA

Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Ariz. 85073

Dear Director:

I would like to comment on the draft environmental statement on the proposed 500-kilovolt transmission line from Palo Verde, Ariz. to Devers, Calif.

1-1 I feel the line would adversely affect the environment and wildlife of the area it is to pass through and should be put aside. Other less destructive methods of transmitting power, should it be necessary, must be found.

I also feel California should be taxed for the energy we are giving them from the Palo Verde station.

1-1 The contractor chosen to build whatever instruments used to transmit the power should be carefully watched to insure no more damage than necessary is done to the environment of our state.

Thank you for your consideration of my comments.

Sincerely yours,

Candae & Steve Hughes

Candae & Steve Hughes
2621 Virginia Dr., #221
Yuma, Ariz. 85364

Response:

1-1 See chapter 4, MITIGATING MEASURES.

2

Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

ARIZONA STATE OFFICE
BU LAND MANAGEMENT
SEP 8 '78
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MGMT SER
PUB AFF
OF
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INFO
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September 6, 1978

Mr. Robert O. Buffington
State Director
Arizona State Office
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

This is in response to your undated request for comments on the draft environmental statement (DES) for the proposed 500 kV transmission line from the Palo Verde Generating Plant, Phoenix, Arizona to the Devers, California substation.

Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Council has determined that this DES does not demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f, as amended, 90 Stat. 1320). However, it appears that the Bureau of Land Management understands its responsibilities and will carry them out in the future.

Should you have any questions, please contact Michael H. Bureman of the Council staff at P. O. Box 25085, Denver, Colorado 80225, or at (303) 234-4946, an FTS number.

Sincerely yours,

Louis S. Wall
Assistant Director, Office of
Review and Compliance, Denver

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2711
LOS ANGELES, CALIFORNIA 90053

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
SEP 11 78
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ASSOC. SD
PCS
RESOURCES
TECH SEC
ADMIN SEC
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CF
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SPLED-E

1 September 1978

Mr. Robert O. Buffington, State Director
United States Department of the Interior
Bureau of Land Management
Arizona State Office
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

This is in response to a letter from your office which requested review and comments on the Draft Environmental Statement for a 500 kv transmission line from the Palo Verde Generating Plant, Phoenix, Arizona to the Devers, California substation.

The Los Angeles District, Corps of Engineers presently has no projects planned for the area of the transmission system. We have no comments on the environmental statement for the proposed action.

We appreciate the opportunity to comment on the project and hope you will continue to solicit Corps of Engineers' comments on future projects.

Sincerely yours,

NORMAN ARNO
Chief, Engineering Division

4

FLOOD CONTROL DISTRICT
of
Maricopa County

3335 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 262-150

BOARD of DIRECTORS
Hawley Atkinson, Chairman
George L. Campbell
Tom Freestone
Fred Koory, Jr.
Ed Pastor

Herbert P. Donald, Chief Engineer and General Manager

ARIZONA STATE OFFICE
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September 14, 1978

Mr. Robert Buffington, State Director
Bureau of Land Management
2400 Valley National Bank Center
Phoenix, Arizona 85073

RE: Draft Environmental Statement, Palo Verde-Devers 500 KV Transmission Line

Dear Mr. Buffington:

We have reviewed the Draft Environmental Statement for the Palo Verde-Devers 500 KV Transmission line. Our comments are as follows:

On page 2-3 in the Water Resources section, Paragraph 3, reference is made to future flood control structures in the Centennial Wash in Harquahala Valley. At the present time the Flood Control District and the Soil Conservation Service of the United States Agricultural Department are jointly preparing maps delineating the floodplain in Centennial Wash. The location of Flood Control Structures in the Valley which consists of levees, dams, and channels has been determined and the District is acquiring right-of-way at this time. Structure Design by the Soil Conservation Service is also underway with construction scheduled to begin in 1979.

4-1 In view of the progress on flood control in Harquahala Valley as outlined above, the District requests close coordination on transmission line route locations in order to avoid conflict with tower locations, transmission line clearance and right-of-way access. Flood control structure location maps are available in this office.

We appreciate having the opportunity to review the Draft Environmental Statement.

Sincerely,

Herbert P. Donald, P. E.
Chief Engineer and General Manager

Response:

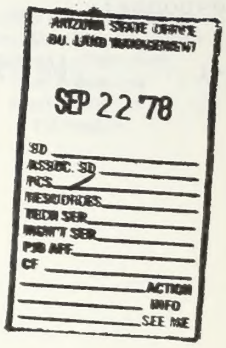
4-1 See chapter 4, MITIGATING MEASURES, Land Use and Ownership.

5

ARIZONA STATE ASSOCIATION OF 4 WHEEL DRIVE CLUBS

2839 North 49th Place
Phoenix, Arizona 85008
September 21, 1978

Mr. Robert O. Buffington
Arizona State Director (911)
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073



RE: Palo Verde-Devers Transmission Line
Environmental Statement

Dear Mr. Buffington:

We have reviewed the above referenced Environmental Statement (ES), particularly, with reference to the wilderness study areas.

5-1 Our opinion is that none of the four (4) Arizona areas qualifies for wilderness.

First, an extensive and well traveled road system either borders or traverses all of the four areas. Saddle Mountain is completely surrounded by a well marked and used road. Agricultural and mining roads also traverse the Little Horn Mountains and East Clanton Hills areas. Several roads lead out from Clanton Well, Hoodoo Well and Sheep Tank. The top of the Eagletail Mountains appears to be roadless, however, several roads lead out from the El Paso Natural Gas Company pipeline on the eastern slopes of the mountains towards Court House Rock, Granite Mountain and Anvil Mountain. We are advised that several dirt roads are also found on the western side of the Eagletails.

All of these roads have existed for over ten (10) years. They meet the BLM's definition of a "road."

Secondly, several State Trust Lands inholdings are found in the Little Horn Mountains, East Clanton Hills and the top of the Eagletail Mountains. See Map 2-8 of the ES. These inholdings will create serious management problems if the areas are designated wilderness.

Third, the ES indicates in Map 2-9 that nonwater related recreational activities, including off road vehicle use, are dominant in the East Clanton Hills area. There is an unreconcilable paradox in designating a wilderness study area in an area where off road vehicle travel is acknowledged. If ORVs use the area, then it does not qualify for wilderness.

5-2 Fourth, the boundaries of the Little Horn Mountains should be modified to exclude the northeast corner of the Yuma Proving Ground. We again find it a paradox that a military gunnery range qualifies for wilderness study. Public safety in a wilderness should not be lightly considered.

Fifth, serious clean air problems exist for all of the areas. This is a two-fold problem. First, if designated wilderness, the areas will be immediately classified as Class I. We submit that none of the areas could presently qualify for this designation, since Interstate 10 crosses near these areas, and rural fugitive dust from grazing and agriculture exceed the Class I standards. Secondly, Class I status would effectively preclude residential, agricultural, commercial and industrial development in this entire area. Since this area is one of the fastest growing sectors in the State, and the construction of the nuclear generating station promises even greater development, the economic impact on the area due to the presence of several Class I areas would be detrimental.

Sixth, we understand that Saddle Mountain is under consideration for a State park. We recommend that this alternative be studied further. While Saddle Mountain does not qualify for wilderness, a park in this area is not only needed but will also provide greater social benefits than a wilderness.

Seven, only the Eagletail Mountains support a significant habitat for wildlife. Wilderness designation may seriously curtail wildlife management and, therefore, we do not believe that the wildlife in this area will benefit from wilderness classification. We strongly recommend that the Eagletails be managed in such a way that the wildlife habitat is protected, and that other management alternatives be developed.

Eight, none of the areas exhibits a particular or unique natural appearance. Flat terrain with desert scrub brush is not uncommon.

Nine, none of the areas offers any appreciable opportunity for primitive recreation. As pointed above, numerous roads border or criss-cross these areas. There are many man-made intrusions, primarily, grazing tanks, mining roads and other evidence of mining activity.

5

Ten, with the possible exception of the immediate top of the Eagletails, none of the areas provides tranquility or solitude.

Eleven, the Arizona Siting Committee has recommended that Subalternate routes J and K be used. Adoption of these routes would terminate wilderness classification for any of the areas. The ES supports this conclusion in Chapter 3.

Lastly, Maps 3-1 and 3-2 show that both the Brenda and Kofa routes would have high impacts on noise, air, soils, and visual and cultural resources, while having medium or low impacts on wilderness values. A wilderness should be free from both noise and air pollution and visual impairments. The ES indicates that this will not be the case for the four (4) areas, if either route is adopted. These findings are sufficient to support the conclusion that none of the four study areas qualifies for wilderness designation.

We hope that the foregoing comments are helpful, and we request to be appraised of all future developments.

Sincerely,

George A. Schade, Jr.

George A. Schade, Jr.
Land Use Chairman

GAS/ks

Response:

5-1 The areas indicated on map 2-12 portray Proposed Wilderness Study Areas. They will be studied following the procedures outlined in BLM's Wilderness Inventory Handbook before final recommendations are made. See chapter 2 - WILDERNESS. Comments will be considered in the forthcoming wilderness studies.

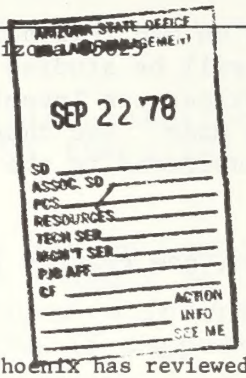
5-2 Text and map revised, see chapter 2 - WILDERNESS and map 2-12.

6

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

3008 Federal Building, Phoenix, Arizona 85025



September 21, 1978

Mr. Robert O. Buffington
State Director
USDI, Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Bob:

The Soil Conservation Service in Phoenix has reviewed your draft environmental statement, Palo Verde-Devers 500 KV Transmission Line, July 1978. For your consideration, we are providing the following comments:

I. Section 2 - Description of the Environment

A. Page 2-5, 3rd paragraph, 3rd sentence

6-1 Suggest that it be changed to read: "If more...subsidence cracks may develop." (Subsidence cracks do not always develop when an overdraft situation occurs.)

B. Page 2-9, Soils, second paragraph, 3rd sentence

6-2 Fluvents-Psamments is an association of two suborders. Therefore, there are five suborders identified, not four suborders as shown.

C. Page 2-10, 3rd paragraph; Map 2-5; page 2-11, last two paragraphs; and page 2-14

6-3 The discussion implies that rockland and badland are soils (Orthents). Actually, rockland and badland are non-soil as they are miscellaneous areas.

II. Section 3 - Environmental Impacts of the Proposed Actions

A. Page 3-9, 4th paragraph

6-4 Figures relating to erosion caused by construction activities are presented. Clarification is needed to indicate whether this is an annual rate or simply that which occurs during the actual construction period. Resultant erosion rates for a post-construction period should be displayed.

6-5 An increase in sediment yield due to construction activities is acknowledged. The impact of this sediment yield on downstream areas should be addressed.

III. Section 7 - Irreversible and Irretrievable Commitment of Resources

6-6 A. Page 7-2, 4th paragraph

Column headings should be:

Corridors	Estimated Acres (ha) Permanently Occupied

IV. Section G - Glossary

A. Page G-1

6-7 argillic horizon: alluvial horizon should be illuvial horizon; eluviation should be illuviation.

B. Page G-2

6-8 badland: badland is non-soil. We prefer that the definition come from the Soil Survey Manual (see Bibliography, page B-3).

C. Page G-4

6-9 eluvial: The definition lacks completeness. We suggest "eluviation - The removal of soil colloids and minerals in suspension due to water movement from a horizon of a soil."

D. Page G-5

6-10 We suggest adding "illuviation - The accumulation of soil colloids and minerals removed from one horizon to another in the soil."

If you have any questions about our comments, please let me know.

Sincerely,

August J. Dornbusch Jr. For

Thomas G. Rockenbaugh
State Conservationist

cc:
Director, Office of Federal Activities, EPA, Washington, D.C. (5 copies)
R. M. Davis, Administrator, SCS, Washington, D.C.
Kenneth L Williams, Director, WTSC, SCS, Portland, OR
August J. Dornbusch, Jr., Asst. State Cons. (WR), SCS, Phoenix, AZ

6

Response:

6-1 Text revised, see chapter 2 - WATER RESOURCES - SUBSURFACE.

6-2 Text revised, see chapter 2 - SOILS.

6-3 Text revised, see chapter 2 - SOILS.

6-4 Text revised, see chapter 3 - SOILS.

6-5 Text revised, see chapter 3 - SOILS.

6-6 Text revised, see chapter 7 - SOILS.

6-7 Text revised, see GLOSSARY.

6-8 Badland as used in this context was taken from California soils surveys conducted by SCS and in this sense includes areas with some thin soils. This definition was used because some plant life occurs and was of environmental concern.

6-9 Definition revised, see GLOSSARY.

6-10 Definition added, see GLOSSARY.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
600 South Commonwealth Avenue • Suite 1000 • Los Angeles • California • 90005 • 213/385-1000

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
SEP 25 '78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
MGM'T SER
PUB AFF
CF
ACTION
INFO
SEE ME

DATE: September 15, 1978

TO: Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Arizona 85073

FROM: Metropolitan Clearinghouse

SUBJECT: Palo Verde-Devers 500KV Transmission Line
SCAG File Number: MC-8808-ED

Thank you for submitting the environmental document for the referenced project for SCAG review. In accordance with procedures developed to comply with the clearinghouse guidelines for the review of voluntarily submitted environmental impact reports, we have disseminated information regarding the document to cities, counties and some special agencies which may be affected by, or interested in the project or the results of the environmental assessment. No comments were received in response to this areawide notification.

Additionally, the environmental document has been reviewed by SCAG staff to determine the relationship of your project and possible environmental impacts resulting from it to adopted regional policies, plans or programs. Staff-to-staff advisory comments generated through this environmental review process are listed below and are transmitted for your consideration.

The SCAG staff review found that:

7-1 1. Environmental impacts have been minimized in both the Brenda and Kofa routes in the California portion of the study area. However, the Brenda route could affect an area of regional significance and concern which has been identified in the SCAG Conservation and Open Space Plan. This area is the Indio Hills where groves of native palms grow along earthquake faults.

7-2 2. Pages 1-25 of the Environmental Statement states that a second 500KV line will undoubtedly be necessary if a license is approved for two additional generating units at PVNGS. Use of double circuit towers for the full length of the line would be preferable to parallel single circuit lines which would occupy more land, require more roads and have more environmental impacts. The second circuit could be strung along the double circuit towers when it is needed.

7

3. No comments have been received in response to the areawide notification.

Clearinghouse Official

LK:mdc

Response:

7-1 See map 3-4 and tables 2-6, 2-7 and 3-3.

7-2 See IMPACTS OF A SECOND 500 KV TRANSMISSION LINE in chapter 3.

8

4350 EAST CAMELBACK, 210E
PHOENIX, ARIZONA 85018

WM. HOWARD O'BRIEN
PHOENIX, ARIZONA

ARIZONA STATE OFFICE
BUREAU OF LAND MANAGEMENT
SEP 29 '78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
MGMT SER
PUB AFF
OF
ACTION
INFO
FILE

September 27, 1978

State Director (911)
Arizona State Office-Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Gentlemen:

8 - 1 As it was pointed out at the B.L.M hearing last night, the Arizona State Plant Siting and Transmission Committee held exhausting hearings regarding the proposed right of ways considersation of the Palo Verde power transmission line through or around the Harquahala Valley. In this connection, the Environmental Impact Statement was prepared and submitted to the committee which studied the E.I.S. as well as entertained comments from numerous interested parties in the matter before you. It was a conclusion of this committee that the preferred right of way line to be placed southwest of the Eagletail Mountains. We continue to support this recommendation and respectfully urge you to yield to the interest of the people of Arizona.

8 - 2 In order that the B.L.M. review team preparing the final Environmental Impact Statement may have the benefit of the complete local hearing process, we strongly recommend that your records incorporate the entire Environmental Impact Statement prepared in behalf of the State Plant Siting and Transmission Committee and the entire record of the hearing process. I am confident that your study of this hearing record will be most revealing with respect to the interest which all of us wish to protect in our environment.

Those of us that appeared at the hearing on September 26th express disappointment that the advance notice was not more timely. Consequently, many of us were ill prepared in our presentation and in the possibility that I may wish to further supplement the record, I would appreciate a copy of the statement which I offered at your hearing. Would you also include the draft Environmental Impact Statement.

Thank you for your consideration of our interests.

Sincerely,

Wm. Howard O'Brien

cc: Karl Kipping, BLM-Yuma
Frank Rogers-Harquahala Valley
Jim Green - Attorney
Stuart Sol - San Francisco

Response:

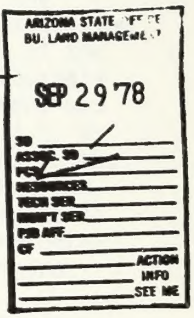
8-1 See chapter 1, INTERRELATIONSHIPS.

8-2 The environmental report prepared for the Arizona State Power Plant and Transmission Line Siting Committee by the applicant has been analyzed and is on file at the Yuma District Office of the BLM as part of the record for the PVDES. A transcript of the Committee Hearing is also on file.

Robert Villaseñor, Jr.
1017 S 18TH PL
PHX, AZ 85034

To Whom it May Concern

I want to let you know right out the these utility people should only be allowed to build their power liner in places where power lines are already at. Enough of this beautiful desert country has already been eaten up by Power lines, highways and the like.



9-1 It'll cost more doing it this way, so I'm told, but that doesn't matter to me. If anyone should be assessed what costs it should be me since, as an electrical consumer, I will ultimately bear the additional charges. But again, it's well worth it to save any bit of God's beautiful countryside!

So put me down, wherever it is that you tally these things, as being in favor of any route which follows existy powerlines and against any route which cuts across unspoiled desert lands.

Thank you.

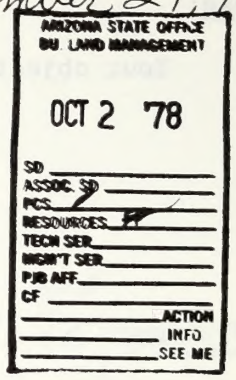
Sincerely
Robert Villaseñor Jr.

Response:

9-1 Your objection is noted.

10

September 29, 1978



Bureau of Land Management
Arizona State Director
2400 Valley Center
Phoenix, Az 85073

To whom it may concern:

10-1 This letter is in regard to the placement of the utility power lines for the Palo Verde nuclear power plant. I urge you to place the new power lines along the routes of existing lines or along the route of an existing highway.

The routes shown in the Draft Environmental Impact Statement were through some unspoiled land. Going through routes of existing lines and highways may be more costly, but as a utility customer, I am willing to foot the bill. I am inner city resident with a moderate income, but unspoiled land to me has no price tag.

Sincerely,

Rosalia Vazquez

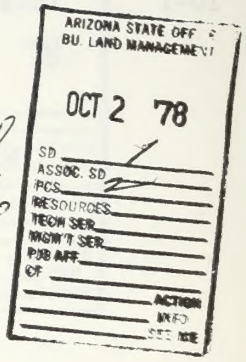
Response:

10-1 This has been evaluated in chapter 8.

11

C. G. Spies
Box 239
Syracuse, N. Y. 13201

28 September 1978



B. Buffington, Director
Arizona State Office
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Ariz. 85073

Subject: Draft Environmental Statement
Palo Verde-Devers 500kV transmission line

Dear B. Buffington:

My interest is with potential bird mortality problems. The spacing between conductors and the size of the insulators seems to preclude electrocution. However, the problem of collisions with conductors or guy-wires may represent a significant hazard and it has not been discussed.

11-1 Since "Migrating waterfowl are commonly seen along the Colorado River [and] Ducks and geese feed in adjacent fields" (p. 2-29), "The Yuma clapper rail is known to inhabit the reparian habitat along the Colorado River..." (p. 2-30), and "The black rail is known to occur along the Colorado River portion of the study area..." (p. 2-30), I feel that special consideration of the collision potential is warranted. In my experience, low altitude flight by herons, ducks, and shorebirds near their feeding areas is especially hazardous when these areas are crossed by conductors or guy-wires. The Final ES should address the potential collision issue, and some assurance should be given that guyed structures will not be used in waterbird habitats.

Thank you for the opportunity to submit my views. Please send me a copy of the FES when it is prepared.

Christian Spies
Christian Spies

Response:

11-1 Collision potential was considered in chapter 2, but not deemed a significant impact. The applicant's proposal indicates that no guyed towers would be used near the Colorado River crossing or over farmlands, see chapter 1.

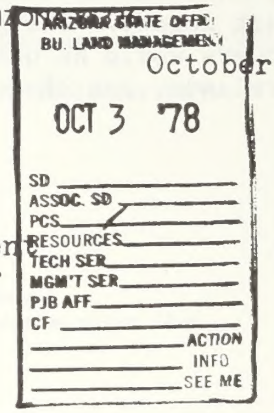
12

WESTWARD MOTEL

EAST SIDE OF BUCKEYE ON CURVE — JUST OFF HIGHWAY 80

R. 1 BOX 6 PHONE 386-4665

BUCKEYE, ARIZONA



October 2, 1978

State Director (911)
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Gentlemen:

I have purchased 30 acres of land in Tonopah on 411th Avenue 1/2 mile south of the I-10 freeway on October 15, 1977. I am planing to build a motel, travel trailer park, and a mobile home park on this 30 acre parcel. The cost of the land, buildings, alterations to date, and zoning is actually quite high but not out of line in relation to present day prices. However, your suggested price of $ 500.00 per acre would be less than 1/10 of my actual cost per acre. 12-1

In addition to my actual costs I would have to ask for a damage fee due to relocation, loss of business, and rising prices in purchasing similar property. For my sake and many of the other land owners in the Tonopah area, I hope that you do not choose the Brenda of the KOFA routes as power transmission corridors.

The route which runs west from the power plant and south of the Eagletail Mountains was the one that all the people from the Tonopah Valley and the Harquahala Valley agreed on to be the most suitable for the power transmission project. The people from Tonopah and the people from Harquahala are the only ones directly affected by the designated power transmission routes. 12-2

The fact that the Brenda and KOFA routes have been chosen as designated routes and the other

routes as alternate choices shows a certain callousness and wrecklessness on the part of the power-mad bureaucracy of many of our government agencies today.

I hope the government agency which gives final approval to this project selects the route south of the Eagletail Mountains.

Yours truly,

Zygmunt R. Dyrcz

Zygmunt R. Dyrcz
945 E. Monroe Avenue
Buckeye, Arizona 85326
386-4665

12

Response:

12-1 The $500 per acre figure refers to replacement lands suitable as fringe-toed lizard habitat. Real estate of this type is in California and remote, dry and sandy. No appraisal value is implied regarding other property in the study area in either state.

12-2 See chapter 8, ALTERNATIVES TO THE PROPOSED ACTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA MANAGER
2800 Cottage Way, Room E-2740
Sacramento, California 95825

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
OCT 3 '78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
MGM'T SER
PUB AFF
ACTION
INFO
ME

OCT 2 19

Memorandum

To: Director, Bureau of Land Management
Phoenix, Arizona

From: Area Manager (AM), Sacramento, CA

Subject: Review of DEIS for Palo Verde-Devers 500 KV Transmission Line, California and Airzona

We have reviewed the DEIS for the Palo Verde-Devers 500 KV Transmission Line. We find the subject statement to be adequate in its presentation of matters of jurisdictional concern to this Service. Our written communication to SCE on September 9, 1976 (attached) indicated that the route which is now known as the "Kofa Route" would have the least adverse impacts to fish and wildlife resources. We are still of that opinion, and would recommend this route in lieu of the alternative routes. However, we believe that portions of all the proposed routes are far too removed from Dillon Road and/or Highway 10. Our letter indicated that any corridor should be constructed no more than 1/4 mile on either side of Dillon Road and/or Highway 10.

13-1 We believe that environmental impacts could be significantly reduced through utilization of existing utility or transportation corridors and recommend that BLM give full consideration to realignment of the proposed transmission line along such rights-of-way.

This concludes our comments on the proposed Palo Verde-Devers Transmission Corridor. We would like to add that we thought this statement was well written, informative and relatively comprehensive, a reflection, we hope of BLM's concern for environmental preservation and protection.

William P. Sweeney

Attachment

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

13

Sept. 9, 1976

Southern CA Edison Co.
100 Long Beach Blvd.
Long Beach, CA 90801

Attention: Mr. C. G. Richards, Right-of-Way &
Land Department

Dear Mr. Richards:

During a recent meeting between yourself and personnel from this office, you requested information regarding Service concerns relating to the transmission corridor alternatives being considered by the Southern California Edison Co. We have evaluated the potential corridors submitted for our review and offer the following for your consideration. These comments, however, are for planning purposes only and are not to be construed as the official Fish and Wildlife Service report on the corridor. Our official report will be prepared at such time as a license is applied for or an environmental statement submitted and it will contain a much more detailed analysis of the selected alternative.

The following discussion references the Devers-Palo Verde 500 KV T/L Study Map dated July 13, 1976. All coordinates mentioned will be from east to west beginning at the Colorado River.

On the basis of information at hand, we recommend that the Corridor F-G-BB-H-Q-R-S-K-L be followed with a modification to follow Dillon Road to Devers Station. This route would have the least adverse impact on fish and wildlife resources. Alternate corridors north of Highway 10 are located in highly concentrated wildlife resource areas. Additionally, these corridors either directly cross or encroach upon the rare desert bighorn sheep habitat. In Corridor K-CC east of Dillon Road several desert springs and watering areas would be traversed. Corridor W-X directly crosses habitat occupied by the rare yellow-billed cuckoo. Alternate corridors to the south of Highway 10 likewise involve the desert bighorn sheep and several desert springs or wash areas of importance. In Sectors L-CC both the Coachella Valley fringe-toed lizard and McCalls horned lizard exist. The Coachella Valley fringe-toed lizard is expected to be on the rare and endangered list by December 1976.

To summarize, all proposed corridors either north or south of Highway 10 encroach upon highly valuable wildlife habitat and therefore would probably be opposed by the Service. Concerning the recommended corridor, we suggest that it be somewhat modified to be constructed no further than ½ mile either to the north or south of Highway 10, except at point L where it should follow Dillon Road to Devers Station.

We understand that San Diego Gas & Electric Company is considering a transmission corridor from their Sundesert Nuclear Plant into the Devers vicinity. If such is the case, there would be no justification for the creation of two separate corridors and we would insist that the possibility of a joint corridor be fully investigated. We therefore recommend that you coordinate closely with San Diego Gas & Electric Company in an effort to consolidate both potential corridors into one.

We appreciate your efforts at early coordination with this office and hope the information provided gives some insight into areas of Service concern. We look forward to continued contact with you on this matter in the future. If you have futher questions, please do not hesitate to call.

Sincerely,

James J. McKevitt
Field Supervisor

KGH:cd

cc: ARD-Env., R.O., Portland, OR

13

Response:

13-1 See chapter 8, ALTERNATIVES TO THE PROPOSED ACTION.

Governor
BRUCE E. BABBITT

Commissioners:
FRANK FERGUSON, JR., Yuma, Chairman
MILTON G. EVANS, Flagstaff
C. GENE TOLLE, Phoenix
WILLIAM H. BEERS, Prescott
CHARLES F. ROBERTS, O.D., Bisbee

Director
ROBERT A. JANTZEN

Asst. Director, Operations
PHIL M. COSPER

Asst. Director, Services
ROGER J. GRUENEWALD

ARIZONA GAME & FISH DEPARTMENT

2222 West Greenway Road Phoenix, Arizona 85023 942-3000

October 3, 1978

Mr. Robert O. Buffington
Arizona State Director (911)
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Re: Draft Environmental Statement - Palo Verde-Devers 500 KV Transmission Line

Dear Mr. Buffington:

Our Department has reviewed the above-referenced document and we find its content to be quite adequate with respect to the description of the ecological scene and the impacts on the vegetation and wildlife resources. However, several additional suggestions and comments are offered which we believe are appropriate.

We support the mitigation commitments by Southern California Edison Company as presented in Chapter 1, specifically:

1. The protection of natural vegetation within the right-of-way where it does not interfere with the performance of work (1-29).

2. Scheduling of construction to avoid nesting, breeding, fawning and lambing of sensitive animal species (1-34, para. 4).

3. The judicious placement of fences and gates to inhibit unauthorized off-highway vehicle use in sensitive species' habitats (1-34, para. 8).

4. The provision and maintenance of new watering places for bighorn sheep near the transmission line route (1-35, para. 4).

14-1 In Table 2-5, the taxonomy used for several plant species is questioned. Castela emoryi (2-18) should probably be Holacantha emoryi, or Canotia holacantha. Mesquite is listed as Prosopis glandulosa (2-18) and should be P. juliflora. Salt cedar (2-19) is generally accepted as Tamarix pentandra, rather than T. ramosissima.

14

14-2 Under the paragraph on desert bighorn sheep (page 2-28), the first sentence is not necessarily true. It is true that sheep utilize the highest mountain terrain, however, they do use the lower foothills, seasonally, and apparently in response to vegetative flushes. Additionally, rams seem to prefer lower elevations during the non-breeding period, although they may utilize all elevations through the course of a year. Exchanges of sheep between mountain ranges is not restricted to herds, but can be single animals or whatever the number of animals associated at that particular time.

14-3 Within the same paragraph on bighorn sheep (2-28), mention is made of rainwater collectors, which are shown on Map 2-7. Upon referring to this map, however, no readily discernible locations could be found.

14-4 In reference to Table 2-8 and page 2-30, the Arizona Game and Fish Department's list of "threatened" wildlife is official. The wildlife listings are by group -- Group II being species or subspecies in danger of being eliminated from Arizona, and Group III as species or subspecies whose status in Arizona may be in jeopardy in the foreseeable future. This list does not utilize the categories of "endangered" or "threatened", as depicted in Table 2-8, but rather the group categories with their individual definitions. On page 2-30, the species that are included in each group are listed, and Table 2-8 should reflect those group headings.

14-5 Included in Table 2-8, as a species likely to occur in the Arizona portion of the study area, is the Sonoran pronghorn. It is very unlikely that this species would occur.

14-6 On page 4-3, under the subsection on Topography, mention is made of mitigating measures for narrow canyons or mountain passes. Since application has been made for the fourth and fifth units at the Palo Verde Nuclear Generating Station and a second transmission line is virtually eminent, our Department would support the requirement that double-circuit towers be constructed, initially, rather than as replacements for single-circuit construction. By doing so, a second period of construction/disturbance could be avoided.

Our Department supports the Arizona mitigation measures for Vegetation, as provided on pages 4-3 through 4-5, and Wildlife, on pages 4-6 to 4-7.

14-7 In Chapter 8, alternatives to the proposed action are discussed. Our Department cannot agree with the level of wildlife impacts as shown on Map 8-4 and expressed on page 8-9 for the "J" and "K" subalternate routes. Medium values exist for wildlife, primarily mule deer and small game, for the western end of "J" (vicinity of Clanton Well and the Picacho and Clanton Hills) and the southern half of "K" (from Cemetery Ridge and along Deadman Wash). Water sources exist in these areas which help to attract wildlife.

14-8 The Arizona Game and Fish Department has reviewed and evaluated the total impacts on the wildlife resource for each of the primary and subalternate routes presented and has concluded that the Kofa Route would be the least detrimental. Modification could be made at either end of this route that would be acceptable, however. On the eastern end, the Brenda routing could be utilized to the point where the Kofa and Brenda routes cross, or the "G-H" subalternate to the Brenda route's eastern alignment may be selected as a third choice. On the western end, the "M" subalternate could be utilized to switch routing to the Brenda route's western Arizona alignment. It has been determined, however, that the selection of modified routing will increase the overall wildlife impacts.

We appreciate the opportunity to review and offer comments on this Draft ES.

Sincerely,

Robert A. Jantzen, Director

By: Robert Weaver, Wildlife Specialist
Planning and Evaluation Branch

RW:dd

cc: Don Wingfield, Supervisor, Region IV
State Clearinghouse 78-80-0048

Response:

14-1 The taxonomy of the several plant species questioned is consistent with most recent nomenclature presented in Munz, 1959, and also Munz, 1974.

14-2 Text revised, see chapter 2.

14-3 Text revised, see chapter 2.

14-4 Text and table revised, see chapter 2.

14-5 Text and table revised, see chapter 2.

14-6 This environmental statement has been written based on the applicant's proposal. The proposal was for single-circuit towers only. If Palo Verde Nuclear Generating Station Units 4 and 5 are approved, there will likely be another proposal, or this one may be amended.

14-7 No change was deemed necessary. Medium values do exist, but not all of the values would be lost.

14-8 Your recommendation on routing will be considered in the decision making process.

October 2, 1978

Yuma District Office
Bureau of Land Management
P.O. Box 5680
Yuma, AZ 85364

RE: Draft EIS on Proposed Palo Verde - Devers 500 k V Electric Transmission Line

15-1 I would like to comment on the Draft EIS for the Palo Verde - Devers 500 kV Line. I feel there should be a discussion in the EIS of the published literature on the possible health effects of megavolt lines e.g., Pollution by Electrical Transmission - the Environmental Impact of High Voltage Lines. L.B. Young and H. P. Young Bulletin of the Atomic Scientists Dec 1974 Vol XXX No 10.

15-2 I also feel that the broader impacts of these lines should have been studied and discussed. In particular, I am concerned about the use of Arizona water to produce power for California. I feel that groups that have a special interest in water rights in Arizona should have had greater participation and representation in this EIS, especially the Native American population of Central Arizona.

15-3 This EIS addresses only short term impacts. This type of narrowly defined research design simply cannot deal with more far-reaching effects. The research design seems, therefore, to be inadequate.

Sincerely,

Patricia S. Mariella

Patricia S. Mariella
828 W. 2nd St. Apt A
Tempe, AZ 85281

15

Response:

15-1 See response to oral comment by Mr. Robert Dingham, Public Hearing, September 27, 1978, Blythe, California.

15-2 Water use in the PVNGS was addressed in the Final Environmental Statement on the PVNGS, issued by the U.S. Nuclear Regulatory Commission.

15-3 Long-term impacts are addressed throughout chapters 3, 6, and 8.

BRYCE FARMS

P.O. DRAWER BA
BLYTHE, CALIF. 92225

PHONE 714-922-2828
922-2200

OCT 1978
RECEIVED
Yuma Dist. Off.
BLM

October 5, 1978

B L M
Karl Kipping
Yuma District
P O Box 5680
Yuma, Arizona 85364

Re: SCE power line rightaway, from Palo Verde Nuclear in Buckeye, Ariz.

Gentlemen:

Please be advised that I am extra violently opposed to any transmission line bisecting the Palo Verde Farm Land or any other public lands.

Please be advised that I am not only opposed but will do my utmost to halt progress on above said transmission lines.

16-1 As I understand it you did not hold a hearing on this in Blythe. I think you have violated our rights to have a public hearing on this.

Sincerely,

Gary A Bryce

16

IN REPLY REFER TO

A-9878

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Yuma District Office
Post Office Box 5680
Yuma, Arizona 85364

This correspondence was written in response to comments in Letter 16

Mr. Gary A. Bryce
Post Office Drawer BA
Blythe, California 92225

Dear Mr. Bryce:

I am sorry you did not receive notice of the public hearing we held in Blythe at 7:30 p.m. on September 27, 1978. We sent copies of the news release to all radio and television stations, as well as newspapers in Southern California and Southern Arizona. We also contacted the newspaper in Blythe on two other occasions regarding the hearing date. However, to my knowledge the notice was never printed. It was announced on the radio the day of the hearing.

Your letter has been made part of the record for the Final Environmental Statement. Since you were not on our original mailing list I have also enclosed a copy of the Draft Statement.

We are currently analyzing the oral and written comments received on the Draft, and hope to publish the Final Statement in January.

If you have any further questions, please let me know.

Sincerely yours,

Karl L. Kipping
Project Manager
Palo Verde-Devers ES

Enclosure

EMPIRE
MACHINERY CO

Mailing Address:
Post Office Box 2985
Phoenix, Arizona 85062

Phone 602/834-3600
Telex 668-407

1725 S. Country Club Dr.
Mesa, Arizona 85201

October 12, 1978

OCT 1978
RECEIVED
Yuma Dist. Off.
BLM

Bureau of Land Management
Yuma District Office
P. O. Box 5680
Yuma, AZ 85364

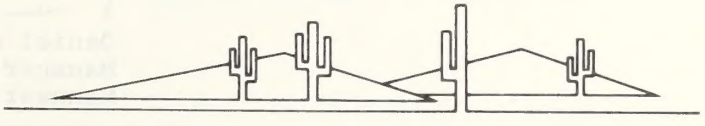
Gentlemen of the Committee:

My name is Jim Patterson. I am representing the owner of Sierra Negra Ranch, located near Tonopah, Arizona, and am a member of the Tonopah Valley Association. The Sierra Negra Ranch is located near the Palo Verde Nuclear Power Plant, and in fact, we control the B.L.M. allotment which completely encircles such nuclear power plant.

We are deeply concerned about the location of the 500 KVA transmission power lines. We will be affected more greatly than any other party along the transmission line corridor because it makes no difference which way the power lines go; whether they come out of the plant to the north, or to the south they must run across some of our grazing land. We are also very concerned about the magnetic field that would be set up around the power lines, and the possibility of damage to our grazing land and livestock. There is also possible danger to our employes who have to work around the power lines when working the livestock. 17-1

We would like to echo the comments made at the B.L.M. Hearing by Mrs. Doris Heisler, the representative from the Tonopah Valley Association, and those of Mr. Frank Rogers from the Harquahala Valley. We would like to go on record in opposition to all the routes mentioned in the B.L.M. study, except the route that was granted by the Arizona Siting Committee to Southern California Edison. The reason for our opposition 17-2

YOUR CATERPILLAR DEALER



17-3 is that the location of the lines along these routes would cause unsafe conditions. Among the unsafe conditions would be crop dusting by air, the operation of private airstrips, working around the towers with farm machinery, and so on. In addition, there would be a loss of net farmable acres, not only to our farm, but any other farm in the Tonopah and Harquahala Valleys which any of the routes would cross.

17-4 Another reason for our opposition is that if the Palo Verde Nuclear Power Plant were granted the right to build Reactors Four and Five, there would be a requirement for additional power lines. At least two and possibly three power lines could be placed in the same corridor. This corridor could be expanded to as much as two miles wide and would literally destroy a great deal of our farming operation. This is true if the routes were to come from the north out of the Palo Verde Power Plant and then go westerly, whether along the Salome Highway or south of the Interstate. Such a corridor could cause temporary, or possibly even permanent, disruption of the agricultural operations in the area.

17-5 We can see no good reason for not running the power line along the route granted by the Arizona Siting Committee. This route goes southwesterly out of the nuclear power plant, south of the Harquahala farming land, and then west and south of the Eagletail Mountains, paralleling the old road which follows a west northwesterly track. If it were deemed necessary to have wilderness areas in this vicinity, this power line could be a division point betweeen the two wilderness areas; one could be to the east, northeast of the power line, and one to the south, southeast of the power line. If it were thought necessary to keep people from veering off of the power line road, there could be a fence built the length of the power line along which it runs through the wilderness area. We agree that there is a need to in the country for wilderness areas to preserve nature; however, we all must recognize that there is room for both. We must look at the alternatives, and the advantages and disadvantages. We must make our decision based upon reason and only after taking into account the effect upon all people. In this instance, we feel that the Siting Committee's judgement was best and should be followed.

Thank you for the concern you have in this matter, and we trust that you will agree with our reasoning and conclusions. If we can be of any further assistance, please notify us.

Sincerely,

Daniel J. Patterson
Manager, Properties Department
Manager, Sierra Negra Ranch

mhh

Response:

17-1 See response to oral comment by Mr. Robert Dingham, Public Hearing, September 27, 1978, Blythe, California.

17-2 See chapter 1, Arizona Power Plant and Transmission Line Siting Committee and map 1-2.

17-3 See chapter 3, LAND USE AND OWNERSHIP, Agriculture.

17-4 See chapter 3, IMPACTS OF A SECOND 500 KV TRANSMISSION LINE.

17-5 See chapter 1, Arizona Power Plant and Transmission Line Siting Committee and map 1-2.

18

ARIZONA STATE OFFICE
BUR. LAND MANAGEMENT
OCT 16 '78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
MGM'T SER
PJB AFF
CF
ACTION
INFO
SEE ME

October 12, 1978
8735 East Weldon Avenue
Scottsdale, Arizona 85251

Bureau of Land Management
Arizona State Director
2400 Valley Bank Center
Phoenix, Arizona 85073

ATTENTION: THE HONORABLE WILLIAM HAMMETT
ADMINISTRATIVE LAW JUDGE

The following are my personal comments regarding the Palo Verde-Devers 500 kV Transmission Line and the Bureau of Land Management's "Draft Environmental Statement" and proposed Wilderness Areas.

ALL PROPOSED PALO VERDE-DEVERS TRANSMISSION ROUTES CROSS THE HARQUAHALA VALLEY, ARIZONA.

AN APPROVED PALO VERDE-DEVERS TRANSMISSION ROUTE WILL CREATE A NEW ENVIRONMENTAL SCAR OF MAJOR AND PERMANENT PROPORTIONS.

THE MAJOR ENVIRONMENTAL SCARS IN HARQUAHALA VALLEY ARE FOUND ONLY IN THE NORTHERN SECTIONS. THESE ENVIRONMENTAL SCARS, THE INTERSTATE 10 FREEWAY AND THE CENTRAL ARIZONA PROJECT CANAL, WERE ESTABLISHED ON ENVIRONMENTAL FACTORS FINDING THEIR PLACEMENTS MORE ENVIRONMENTALLY COMPATIBLE THAN IN OTHER AREAS OF HARQUAHALA VALLEY AND IN ALIGNMENT WITH ENVIRONMENTAL FACTORS OF NEIGHBORING AREAS OF ARIZONA.

IN HARQUAHALA VALLEY THE PALO VERDE-DEVERS 500 KV TRANSMISSION LINE SHOULD BE APPROVED FOR THE SAME CORRIDOR AS THE FREEWAY AND THE CANAL.

MAJOR ENVIRONMENTAL SCARS SHOULD NOT BE APPROVED FOR PRIME NATURAL AREAS SUCH AS THE EAGLETAIL MOUNTAINS DESIGNATED BY THE ARIZONA ACADEMY OF SCIENCES AND THE PROPOSED WILDERNESS AREAS OF THE BUREAU OF LAND MANAGMENT.

18-1 CROSSING HARQUAHALA VALLEY SUBALTERNATE "D-F" SHOULD BE THE ROUTE APPROVED FOR THE PALO VERDE-DEVERS 500 KV TRANSMISSION LINE.

I appreciate the opportunity to comment on Palo Verde-Devers routing and the B.L.M. proposed Wilderness Areas.

Thanking you,

Best regards,

Donald G. Begalke

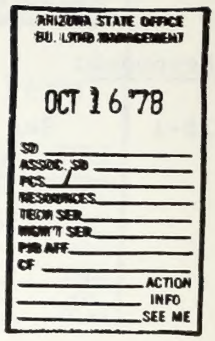
Donald G. Begalke, Citizen and
Harquahala Valley Property Owner

cc: Mr. Karl L. Kipping
B.L.M. Palo Verde-Devers Project Manager

Response:

18-1 See chapter 8, SUBALTERNATE ROUTES D-E-F.

19



October 12, 1978
8735 East Weldon Avenue
Scottsdale, Arizona 85251

Bureau of Land Management
Arizona State Director
2400 Valley Bank Center
Phoenix, Arizona 85073

ATTENTION: THE HONORABLE WILLIAM HAMMETT
ADMINISTRATIVE LAW JUDGE

The Harquahala Valley Environmental Association appreciated the opportunity to express our position to you at the recent hearing in Phoenix September 26, 1978 regarding the Bureau of Land Management's "Draft Environmental Statement" for the Palo Verde-Devers 500 kV Transmission Line.

Following our testimony at the hearing, below is our written statement:

The H.V.E.A. participated as an intervenor at the March 2 & 3, 1978 hearing regarding the Palo Verde-Devers line before the Arizona Power Plant and Transmission Line Siting Committee.

The decision of the Siting Committee is enclosed in B.L.M.'s "Draft Environmental Statement" Chapter 1, Map 1-2.

19-1 The Siting Committee's decision for a Certficate of Environmental Compatibility of the Palo Verde-Devers line is a compromise of the applicant, the Southern California Edison Company, and the intervenors.

The Harquahala Valley Environmental Association supports the Siting Committee's Palo Verde-Dever transmission route and urges its approval by the B.L.M. with respect to the proposed Wilderness Areas.

As an alternate transmission route crossing the Harquahala Valley, the H.V.E.A. supports Subalternate Route "D-F" (named Subalternate S-23 before the Siting Committee) as the Palo Verde-Devers line.

The Harquahala Valley Environmental Association appreciates this opportunity to comment on B.L.M.'s "Draft Environmental Statement" regarding the Palo Verde-Devers 500 kV Transmission Line.

Thanking you,

Best regards,

Donald G. Begalke

Donald G. Begalke, President
Harquahala Valley Environmental Association

cc: Mr. Karl L. Kipping
B.L.M. Palo Verde-Devers Project Manager

Response:

19-1 See chapter 1, Arizona Power Plant and Transmission Line Siting Committee and map 1-2.

20

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
OCT 16 '78
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ASSOC. SD
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RESOURCES
TECH SER
MGM'T SER
PJB AFF
CF
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SEE ME

October 12, 1978
8735 East Weldon Avenue
Scottsdale, Arizona 85251

Bureau of Land Management
Arizona State Director
2400 Valley Bank Center
Phoenix, Arizona 85073

ATTENTION: THE HONORABLE WILLIAM HAMMETT
ADMINISTRATIVE LAW JUDGE

The Harquahala Ranches Home Owners and Property Owners Association had not studied the Bureau of Land Management's "Draft Environmental Statement Palo Verde-Devers 500 kV Transmission Line" in preparation for the September 26, 1978 hearing in Phoenix which you conducted. Since our studies are more complete, our association desires to inform you our positions regarding the transmission routing and the proposed B.L.M. Wilderness Areas.

Harquahala Ranches Owners are committed to compatible life with wildlife and birdlife and have spent thousands of dollars and thousands of man-hours devoted to our "refuge" adjacent to the Eagletail Mountains. Our folks support activities promoting the refuge and maintaining the Eagletail Mt. Natural Area (the Arizona Academy of Sciences designated the Eagletails a Nature Area).

20-1 The Palo Verde-Devers line is environmentally incompatible following Subalternate "G-H" (B.L.M. ... Statement.) with respect to the B.L.M. proposed Eagletail Wilderness Area and the Harquahala Ranches Bird And Wildlife Refuge.

The segment of the "Brenda" Palo Verde-Devers in Harquahala Valley is environmentally incompatible with the Eagletail Wilderness Area and is environmentally close to the Harquahala Ranches Bird And Wildlife Refuge.

The Palo Verde-Devers route approved by the Arizona Power Plant And Transmission Line Siting Committee (Map 1-2 of B.L.M.'s Statement) passes south of the Eagletail Wilderness Area. However, this approved route does conflict with other B.L.M. wilderness proposals and is close to the Refuge. Our Association will support the Siting Committee's routing decision if B.L.M. approves.

The Harquahala Ranches will support Subalternate Palo Verde-Devers Routing "D-F" as it crosses Harquahala Valley if approved by the B.L.M.

The Harquahala Ranches Home Owners And Property Owners Association thank you for this opportunity to comment on the Bureau of Land Management "Draft Environmental Statement Palo Verde-Devers 500 kV Transmission Line."

Best regards,

Donald G. Begalke

Donald G. Begalke, Chairman
Palo Verde-Devers Study Committee of the
Harquahala Ranches, Harquahala Valley, Arizona

cc: Mr. Karl L. Kipping
B.L.M. Palo Verde-Devers Project Manager

Response:

20-1 Your comments have been noted.

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B.L.M. AZ STATE OFFICE
OCT 16 1978
10:00 A.M.
PHOENIX, ARIZONA

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WEP-7/73)
WASHINGTON, D.C. 20590
PHONE: 202-426-3300

16476/7.b 489
10 OCT 1978

U. S. Department of the Interior
Bureau of Land Management
Arizona State Office
2400 Valley Bank Center
Phoenix, Arizona 85073

Gentlemen:

On behalf of the Department of Transportation the concerned operating administration and staff of the U. S. Coast Guard have reviewed the draft environmental impact statement for a 500KV transmission line from the Palo Verde Generating Plant, Phoenix, Arizona, to the Devers, California substation. We have neither comments nor objections to offer on this proposal.

The opportunity to review the environmental impact statement is greatly appreciated.

Sincerely,

J. D. [illegible]
[illegible] Coast Guard
[illegible]ental
By direction of the [illegible]

SPEED LIMIT 55
It's a law we can live with.

LAWRENCE CHAFFIN, M. D.
132 NORTH HUDSON AVE
LOS ANGELES, CALIFORNIA 90004

OCT 1978
RECEIVED
Yuma Dist. Off.
BLM

October 12, 1978
RE: Proposed Devers - Palo Verde
500 KV Transmission Line

Mr. Karl Kipping
Bureau of Land Management
Environmental Statement Team
Yuma District Office
P. O. Box 5680
Yuma, Arizona - 85364

Dear Mr. Kipping:

I am advised that a meeting was recently scheduled by the Bureau of Land Management to be held in Blythe so that involved farmers and interested citizens could voice their opposition to the above Southern California Edison High Tension Power Line. I believe almost none of the involved farmers were aware of this meeting. I am therefore using this letter as a means of sending to you my opinion concerning this proposed power line.

22-1 Since 1946, I have planeed and worked very hard in developing a 2,000 acre farm in the Palo Verde Valley. I have done everything possible to make this a farm attractive and pleasing to the eye. This high tension line will completely destroy the country beauty of this farm, since the proposed line runs two miles through the center of my farm.

Concrete structures upon which these towers are built will forever interfere with land tillage, irrigation, and weed control. Farm machinery will forever be damaged in operating about these structures.

Overhead high tension lines greatly interfere with air application of fertilizers, weedicides, and insecticides. It is impossible to do an effective job in the application of these materials in the immediate vicinity of these high tension power lines.

These high tension lines are a substantial hazard to drop dusters' lives. (See attached letter from West Coast Flying Services, Inc. - This is the service I use on my Palo Verde farm.)

Palo Verde Valley has all the recreational attractions of Palm Springs, plus the Colorado River. I believe that within twenty-five years this Valley will be a major recreational center. A high tension power line passing through the center of a recreational area would do great damage, and be a source of potential danger.

There are alternating routes. The San Diego Gas and Electric Company owns a large block of land in the Southern end of the Palo Verde Valley, and no doubt would welcome a high tension power line passing through their property.

I would be most grateful for any advice you might give me and other involved farmers in presenting a united opposition to this power line project, which I firmly believe would be in the public's interest.

Sincerely yours,

Lawrence Chaffin M.D

Lawrence Chaffin, M. D.

LC:AF
ENC

22

West Coast *Flying* Services, Inc.

OF PALO VERDE VALLEY
Route 2 — Box 36H
Blythe, California 92225

CROP CARE BY AIR
TELEPHONE (714) 922-3801

August 30, 1977

Dr. Lawrence Chaffin
Chaffin Ranch
132 N. Hudson
Los Angeles, California 90004

Dear Dr. Chaffin,

This letter is in answer to your question as to what problems we might encounter if the proposed power line was to be installed on your ranch.

Probably most important to me is the danger involved for me and my pilots. I have known several pilots that were killed when the airplane they were spraying with hit power lines. It poses one of the greatest hazards to an agricultural pilot.

22-2 Secondly, and this is very important to you, it limits us in how effectively we apply your chemicals. It is very difficult for us to spray around power lines and poles. A field that is open is much easier to spray than one that has power lines. There are always areas close to lines where it is impossible to apply insecticides, herbicides, etc. But if the fields are open we can apply the chemicals to the entire field and therefore do you a better job.

We were surprised that they are proposing to put this power line in a farming area. With all the aerial spraying that is done in the Valley, if a plane were to hit a power line it would cause a major power outage.

In my opinion, the proposed power line would cause a very difficult situation for the farmer and for the agricultural pilot.

Sincerely,

James Clayton, President

JC:rc

Response:

22-1 See chapter 3, VISUAL RESOURCE MANAGEMENT, IMPACTS.

22-2 See chapter 3, LAND USE AND OWNERSHIP, Agriculture.

23

United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
PACIFIC SOUTHWEST REGION
SAN FRANCISCO, CALIFORNIA 94102

IN REPLY REFER TO: E3041
Palo Verde

OCT 12 '78

RECEIVED
B.L.M. AZ STATE OFFICE

OCT 17 1978

10:00 A.M.
PHOENIX, ARIZONA

Memorandum

To: State Director, Bureau of Land Management, Arizona

From: Acting Regional Director

Subject: Review of Draft Environmental Statement for Palo Verde - Devers 500 kV Transmission Line

We have reviewed the subject statement and offer the following comments for your consideration.

The proposed corridors appear to be carefully routed to avoid major parks such as Joshua Tree National Monument. However, we are concerned that these corridors could create serious impacts on less well-known recreation resources such as La Posa Recreation Site, Wiley Well, Corn Springs, Mecca Hills, and Kofa National Wildlife Refuge. Selection of transmission line routes often involves a trade off between lessening visual impact by moving the route out of sight of highway travellers, and adversely affecting the recreation value of backcountry areas. The mitigation measures proposed by SCE and BLM, consisting mostly of careful placement of individual towers and use of nonreflective materials in construction, would do little to minimize the intrusive effect of the transmission line in areas where recreationists expect to find solitude and natural landscapes. At La Posa, visual impacts of the Brenda Route could be so severe that visitors would be discouraged from using the facilities. We suggest that alternatives paralleling the highway more closely should be considered.

23-1

Alternatives closer to existing routes could not only mitigate the anticipated impacts on La Posa, Wiley Well, and Corn Springs but also would alleviate some impacts on wilderness study areas. The advantages of the Brenda Route in terms of keeping the Kofa Wildlife Refuge's continuity and expansion potential, as well as its wilderness potential, could outweigh the route's greater visual impact on highway travellers.

23-2 The statement fails to address the effect of the proposed transmission line on BLM recreation composite planning. The Mecca Hills area, a checkerboard of Southern Pacific and BLM land, has been identified by BLM as a good prospect for acquisition under the recreation composite program. Badlands topography, colorful rock forms and scattered palm oases are the Mecca Hills' major resources. High priority tracts within the composite are Hidden Springs, a popular hiking and camping destination, and tracts along Highway 195. Those affected by the line's intrusion would be not only the hikers and campers, but also a large number of pleasure drivers who enjoy the views along Highway 195, a potential state scenic highway.

23-3 We note that the Eagletail Mountains, Orocopia Mountains, Mecca Hills, and Indio Hills Palm Groves possess not only recreation value, but natural and scientific value rated in the Mohave-Sonoran Natural Region Theme Study to be of "highest national significance." Accordingly, these areas are potentially eligible for listing on the National Registry of Natural Landmarks.

23-4 Density predictions are very useful in comparing the potential impacts of the alternate corridors on cultural resources, and BLM appears to have collected enough data to make these predictions. However, federal guidelines on cultural resource protection place major emphasis on identifying properties on or eligible for the National Register of Historic Places at the early stages of planning, in order to avoid impacts wherever possible. BLM has identified several properties within the corridors (i.e., Winter's Wash Archeological District) which may be eligible for the National Register but require further study. BLM does not plan to complete this study until the final center line is chosen (page 2-49). We believe that the intent of 36 CFR 800 would be better satisfied if evaluation of these sites were to be completed and determinations of eligibility requested prior to corridor selection, so that the choice of corridor could be made with full knowledge of probable impacts on National Register-eligible properties. The State Historic Preservation Office is available to help in applying the National Register criteria to sites, designing further studies, and preparing documentation to accompany requests for determinations of eligibility.

23-5 Several specific points in the cultural resource analysis need clarification. First, the statement on page 2-47, that, of the cultural resources in the study area on or eligible for the National Register, "none are within the two-mile-wide corridor" contradicts data in the table on page 2-48. There is a similar contradiction between the statement on page 2-49, under "State Historic Places Properties," and table 2-15 on page 2-52. Another problem with table 2-15 is that it omits some historic areas that are noted as

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sightseeing attractions in the Recreation section, pages 2-37-39. The accompanying text refers to the Cultural Resource section for additional discussion, but these sites are not mentioned further in the statement.

23-6 Last, although we recognize the need to protect valuable sites from vandalism by limiting publication of their precise locations, there would seem to be little harm in including the names of National Register sites in the environmental statement. This omission makes it extremely difficult to cross-check our files for any relevant information we may have.

In summary, we believe that for the alternate routes presented, there would be least impact on recreation and cultural resources if the selected route incorporated:

- Segment C out of PVNGS.
- The Brenda Route, with subalternates G and H, with the center line placed on the east side of the corridor to minimize impacts on the Eagletail Mountains.
- The Brenda Route north of the Kofa Game Refuge, and continuing to west of Desert Center.
- The Kofa Route from west of Desert Center, which avoids Jaeger Sanctuary and the Chuckwalla Mountains, and also causes less impact on the Mecca Hills.

Thank you for the opportunity to comment on this statement.

S JAMES R MILLS

James R. Mills

cc: OEA, WASO
SHPO, California and Arizona

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PHOENIX, ARIZONA

Response:

23-1 See page 8-3 and map 8-1.

23-2 The document considers the recreation portion of the BLM planning system where the plannning system documents were completed. See chapter 2 - Recreation Resources.

23-3 The unique aspects of the Eagle Mountains, Orocopia Mountains and Mecca Hills have been recognized in their selection as Proposed Wilderness Study Areas, see chapter 2. The unique natural areas of palm groves are also recognized in the Indio Hills, see chapter 2.

23-4 Manpower, funds and time will not allow for study or eligibility determination of known potential Historical Register Sites prior to corridor selection. The mitigation listed in the ES should resolve any problems prior to issuance of a right-of-way.

23-5 Text revised, see chapter 2. State and National Register Properties. Some text changes have been made for clarification. Tables 2-15 and 8-2 list all historic sites, including many not being considered for a National or State Register, which are within the 2-mile-wide corridor or close to the corridor. Historic sites beyond the reasonable distance of possible adverse impact by the proposed powerline are excluded from tables 2-15 and 8-2.

A table including the names and location (with an accompanying map) of all National Register and State Historic Landmarks has been prepared for the ES backup data for professional review (see items 13 and 14 on page A-5). The inclusion of specific names and locations of National Register or State Historic Landmark Properties in the ES text would not materially serve the purpose of the document. The primary function of the ES is to provide a tool for decision making to the manager who will make the final route selection. The values of all cultural resources, including Register and Landmark Properties, are accounted for in the cultural resource charts and maps in the text (i.e., density; table 2-14 and map 2-14; sensitivity, table 2-16 and map 2-15; and impacts, table 3-6, and map 3-9 for Brenda and Kofa Routes, with similar tables and maps for each subalternate route in chapter 8).

23-6 Data available to qualified researchers, see chapter 2 - CULTURAL RESOURCES.

24

United States Department of the Interior
BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

ARIZONA STATE OFFICE
BU LAND MANAGEMENT
OCT 18 78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
MGMT SER
PUB AFF
CF
ACTION
INFO
SEE ME

IN REPLY REFER TO: LC-150
125.2

Your reference:
510 (911)
A9878

OCT 16 1978

Memorandum

To: Bureau of Land Management, Arizona State Director (911), 2400 Valley Bank Center, Phoenix, Arizona 85073

From: Regional Environmental Officer

Subject: Draft Environmental Statement for a 500-kV Transmission Line - Palo Verde-Devers Generating Plant

The Lower Colorado Region of the Bureau of Reclamation has reviewed your draft environmental statement for a 500-kV transmission line from the Palo Verde Generating Station, Phoenix, Arizona to the Devers, California substation. We offer the following comments for your use.

Construction of the Palo Verde-Devers 500-kV transmission line by the Southern California Edison Company may effect the need for series compensation in the Southern Transmission System of the Navajo Project of which the United States is a participant. The design or location of the Palo Verde-Devers Transmission Line is not impacted by this effect but system conditions will be altered after the line is placed in service.

24-1 On page 1-24, Interrelationships, subtopic Sundesert, it should be acknowledged as to whether the proposed site for Sundesert Nuclear Generating Station has any bearing on the location of the proposed Palo Verde-Devers 500-kV Transmission Line. If it has no bearing, we believe this should be stated.

24-2 On page 1-27, first paragraph, last sentence, please specify the copy that is on file. We connot determine whether it is the environmental guidelines of WSC or the applicant's commitment.

Thank you for the opportunity to comment on your statement.

F. Phillip Shoppe

cc duplicate

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

Response:

24-1 Location of the Sundesert plant has no effect on location of the Palo Verde-Devers line, however, common use of transmission corridors was considered. See chapter 1 - INTERRELATIONSHIPS.

24-2 Text revised, see chapter 1.

25

Southern California Edison Company

P.O. BOX 410
100 LONG BEACH BLVD.
LONG BEACH, CALIFORNIA 90801

C. J. LOWERISON, JR.
MANAGER
OF
RIGHT OF WAY AND LAND

Mr. Karl L. Kipping
Project Manager
Bureau of Land Management
Yuma District Office (050)
P. O. Box 5680
Yuma, AZ 85364

October 17, 1978

Dear Mr. Kipping:

Subject: A 9878 and CA 4163
Palo Verde-Devers 500 kV T/L
Draft Environmental Statement

In accordance with the Federal Register, Volume 43, No. 163, Notice of August 22, 1978, the Southern California Edison Company hereby submits written comments relative to the Draft Environmental Statement on the proposed Palo Verde-Devers 500 kV Transmission Line Project.

Very truly yours,

C. J. Lowerison, Jr.

Enclosure

SOUTHERN CALIFORNIA EDISON COMPANY
DRAFT ENVIRONMENTAL STATEMENT
PALO VERDE-DEVERS 500 KV T/L

COMMENTS REQUIRING RESPONSE

CHAPTER I

Page 1-6 - KOFA ROUTE - The Kofa Route cannot physically enter the Devers Substation as shown on Map 1-1. The Kofa Route must enter the northeast corner of the substation exactly where the Brenda Route does in order to connect with the design of the substation layout. In addition, the Kofa Route cannot exit PVNGS, as shown, due to the progress of the switchyard.

25-1

Page 1-12 - Devers Substation - As indicated in Section 9.1-10 of Edison's EIR, the possibility still exists of placing series compensation facilities somewhere along the line route instead of within Devers Substation. A probable location will be 60-80 line miles east of Devers Substation. The decision of where to locate the facilities cannot be made until mid-1979 after an economic evaluation is made based on equipment bids. Edison recommends that this alternative be made a part of this ES to accommodate this contingency.

25-2

Page 1-14 - Construction Yards and Batch Plants, second paragraph, first line - Change "1 acre" to "0.5 acre". Batch plant sites will be approximately 0.5 acre in size, as indicated on Page 4.1-2 of Edison's EIR.

25-3

Page 1-15 - Table 1-4 - Footnote "e" - The acres are incorrect. The area of permanent occupation should be 100 square feet per tower, which is the area around the four footings. These changes in acreage should be corrected throughout the balance of the ES.

25-4

Page 1-34 - General Mitigation Measures, third paragraph, last sentence - Add "during the breeding season" at end of sentence. Edison has only committed to stopping construction activities during the breeding season within one mile of active raptor nests. See Edison's EIR Page 5.5-8, Part d.

25-5

Page 1-37 - Land Use - Delete second sentence, second paragraph. Additional Edison research has found that increased conductor-to-ground clearance will not be a useful mitigation measure for crop dusting activities.

25-6

25

Page 1-38 - Electrical Effects, sixth line - Delete the word "stray". The word implies that electrical effects are uncontrolled. Electrical effects are very much controlled by the design of the line and are fully contained within the right of way.

25-7

CHAPTER III

Page 3-14 - Chuckwalla Valley Dune-Thicket - It is Edison's understanding that the BLM has approved a pipeline right of way for SOHIO through the dunes north of the thicket. The pipeline will undoubtedly have a maintenance road which Edison also proposes to use instead of constructing a new road through the area.

25-8

Palm Oases - There will be no increased public access in this area, as Edison will use an existing road for construction and maintenance.

25-9

Page 3-25 - Recreation Impacts - The use of the Chuckwalla Valley is predominantly for ORV in the areas from the Mule Mountains and Little Chuckwalla Mountains north to Interstate 10. Most sensitive uses are to the south of the mountains in the Wiley Well Campground area. The line would cross the ORV area and the access road, therefore, the impact level should be moderate.

25-10

Page 3-27 - Recreation Impacts, first paragraph, line 2 - It is conjecture on the author's part that a major power line would cause present visitors to move elsewhere. Second paragraph, line 3 - "The physical existence of steel towers will constitute a high impact on the recreation experience of the area." It is not stated as to whether this high impact will be to the naturalist's recreation or to ORV recreation. It is stated in the last paragraph on page 3-24 that the sightseer or naturalist may strongly object to the towers as they affect the pristine qualities of the country or that the ORV enthusiast may object to towers when they physically restrict ORV movement. This area is not pristine and has existing pipeline scars. The towers will not be placed directly on the pipeline, therefore ORV movement will not be restricted. Based on these facts and the impact criteria on page 3-27, the high impact rating for the Copper Bottom Pass, on Page 3-27, Paragraph 2, on Map 3-6 be revised to medium or low. "The Orocopia Mountains-Corn Springs area" is not discussed for the Kofa route as stated in the text.

25-11

Page 3-29 - Agriculture, second paragraph - There is no reference of this report in the Bibliography section of the ES. Of the 85 accidents, what percentage involved aircraft engaged in crop dusting activities? The inability of

25-12

the pilot to see the wires and poles does not constitute that the line was a hazard. Weather conditions and flying at illegal altitudes also may cause accirdents.

Page 3-32 - Wilderness Areas Impact Criteria - Based on the criteria stated, that "High impacts are considered to be the direct impacts which occur where the proposed transmission line would physically cross a study area boundary", the following areas cannot be rated as having high impacts because the line is outside the boundary:

25-13

BRENDA CORRIDOR - Eagletail Mountains (Page 3-33)

Pilot Mountain (Page 3-34)

Corn Springs (Page 3-34)

KOFA CORRIDOR - Areas in Kofa Game Range (Page 3-34)

Pilot Mountain (Page 3-35)

Corn Springs (Page 3-35)

Page 3-33 - Wilderness Areas, Impact Criteria - It is stated on this page that "high impacts are considered to be direct impacts which occur where the proposed transmission line would physically cross the study area boundary". Map 2-12 shows that not all of the Subalternate K-L corridor traverses wilderness study areas 2, 3 and 4. However, Map 3-7 shows a high impact as does the text on page 8-9 for the entire Subalternate K-L corridor. Map 3-7 and the text on page 8-9 are therefore not consistent with the criteria for what constitutes a high impact as discussed on page 3-33. This should be revised to a medium impact per the impact criteria on page 3-33.

25-13

Most importantly, Subalternate K-L is an integral part of the route approved by the Arizona Power Plant and Transmission Line Siting Committee. Map 3-7 identifies subalternate K-L as having a high wilderness impact. It is stated on page 4-7 that "The centerline will not be located in areas designated as high impact on map 3-7." Thus, although it is stated on page 1-26 that "...the action taken by the Committee will be considered and weighed against the impacts identified in this Statement," the designation of high wilderness impact on Subalternate K-L precludes any consideration of the Siting Committee approved route. The statements on pages 4-7 and pages 1-26 are contradictory since it

25-14 | appears as if the decision has already been made. The portion of the Subalternate K-L corridor between Wilderness Areas 2, 3 and 4 should be changed to a medium impact not only to reflect the fact that a corridor does exist, but also to permit full consideration of the decision of the Arizona State Siting Committee.

Page 3-36 - Impacts, last paragraph - It is stated in paragraphs 1 and 2 that construction and maintenance roads constitute a visual intrusion. According to the wilderness study area impact criteria on page 3-33, it is inferred that a wilderness boundary would not include a visual intrusion such as a road. However, on page 3-34 under Kofa Corridor, first paragraph, high impacts are noted to Wilderness Study Area 2 "along the existing pipeline route." The Kofa Corridor parallels the existing El Paso natural gas (EPNG) pipeline road which is a visual intrusion. Therefore, since intrusions do exist within the current study area boundaries, the boundaries should be moved so that the EPNG road is outside the wilderness study area boundaries.

25-15 | 25-16

Page 3-39 - Low Impacts, third paragraph - In the area north of the Indio Hills, there is more population and proposed subdivisions than in any other area along the Kofa Route. Edison believes there are no existing facilities in this area of the nature of a 500 kV line, therefore, we emphasize the visual impact is high.

25-17

Page 3-48 - Third line from top - Edison disagrees that the crossing of I-10 by the Brenda Route constitutes a high impact. This crossing has been carefully selected to avoid the views of motorists as much as possible and the line will only be seen briefly. The impact should be low. We also disagree with the high visual impact rating given to the crossing of Wiley Well Road, since the crossing is nearly perpendicular and the use of this road is in no way equivalent to the use of I-10, which is also rated high. The line crossing I-10 cannot be the same as crossing Wiley Well Road unless they are both rated low.

25-18

Page 3-58 - Fourth paragraph - Revise this paragraph, since it is no longer applicable. The Sundesert Project was suspended in May 1978.

25-19

Page 3-60 - Twelfth line from top - Delete sentence beginning "If these families...". See previous comment.

25-20

25-21 Economic Conditions - The construction worker peak will occur during the first quarter of 1981 only. Delete the words "fourth quarter of 1980 and the" in the third paragraph.

Page 3-61 - Table 3-8 - The CCD's in this Table should be revised to read as follows:

Buckeye CCD	39	07/80 - 09/80
	118	10/80 - 12/80
	145	01/81 - 03/81
	69	04/81 - 06/81
Parker CCD	0	0
Palo Verde CCD	39	07/80 - 09/80
	118	10/80 - 12/80
	177	01/80 - 03/81
	163	04/81 - 06/81
	145	07/81 - 12/81
Indio-Palm Springs CCD	32	01/81 - 03/81
	69	04/81 - 06/81
	145	07/81 - 12/81

25-22

CHAPTER IV

Page 4-4 - Palo Verde-Seguaro-Mileposts 65 to 80 - Installing towers by helicopter is costly (approximately three times as much per mile) for the applicant when compared to normal installation practices. Therefore, every effort should be made by the BLM to limit the number of individual towers that will require helicopter construction or other non-conventional methods.

25-23

It is emphasized that even where helicopter construction is designated, roads will be necessary for use by conventional vehicular equipment required to install and sag conductors and that these roads would serve as well for equipment required to install towers in the conventional manner.

Tamarisk-Riparian-Mileposts 104.6 to 105.2 (Brenda)
Dry Wash-Milepost 183.6 (Brenda)
Sand Dunes-Milepost 215 and 230 (Brenda)

25-24 All of the above should have revised sentence to read: "Towers will be spaced at the maximum distance to span widest possible habitat area". It may not be possible to span all habitat, however, Edison will attempt maximum efforts within engineering constraints on span lengths.

25-25 Palm Oasis-Mileposts 209 to 232 - The Palm Oasis isn't 23 miles in length. There are several in this area, which one is being referenced?

Page 4-5 - Mesquite Wash-Milepost 33 (Kofa)
French Wash-Mileposts 75-77 (Kofa)
Tamarisk-Riparian-Mileposts 102 to 102.6 (Kofa)
Dry Wash-Milepost 193 (Kofa)

25-26 All of the above should have revised sentence to read: "Towers will be spaced at the maximum distance to span widest possible habitat area". It may not be possible to span all habitat, however, Edison will attempt maximum efforts within engineering constraints on span lengths.

Page 4-6 - Wildlife, first paragraph - Edison objects to replacing watering facilities two for one. Edison will be glad to mitigate items which are deemed to have been impacted by construction activities, but only on a fair and equitable basis.

25-27

Page 4-8 - Visual Resources, third paragraph - Edison does not agree that all conductor should be non-specular. It is Edison's experience that specular conductor has an initially higher impact than non-specular, but that after a few years of exposure to the environment and its elements, the specular conductor will have the same impact as non-specular.

25-28

However, Edison will use non-specular conductor in those locations that have high visual impacts as indicated in Edison's EIR.

Page 4-9 - Cultural Resources, Items 2a-b-c - Applicant wishes to know basis for widths and areas to be surveyed for cultural resource inventory, as specified in 2a-b-c. In Chapter 1, pages 35 and 36, applicant has committed to conducting cultural resource survey in all areas where surface disturbance will occur.

25-29

SOUTHERN CALIFORNIA EDISON COMPANY
DRAFT ENVIRONMENTAL STATEMENT
PALO VERDE-DEVERS 500 KV T/L

COMMENTS REQUIRING NO RESPONSE
EDITORIAL OR TEXT CHANGE

SUMMARY - Item 3, last line - Change last line to read: Some permanent and temporary removal of agricultural land from productivity, depending on the route approved.

Item 6 - Change July to August 1978.

MAP 0-0 - Should have lower right-hand title block of: GENERAL LOCATION MAP AND ROUTES UNDER STUDY.

CHAPTER I

Page 1-1 - Add "Units 1, 2 and 3" between "PVNGS" and "power" to distinguish from Units 4 and 5 which has a different power entitlement for Edison.

Page 1-4 - Federal Aviation Agency - This agency does not issue air space permits for powerlines and towers. They do perform aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace. They recommend mitigating action affecting either the party constructing the obstruction or to the owner of an affected airport. This agency does not have enforcing powers, they are only advisory.

Edison reports to the FAA all plans for transmission line construction and seeks to resolve all their concerns regarding hazards to air navigation. Please change the definition to reflect same.

California State Agencies - Add, California State Lands Commission. According to page 4-12 and page 9-9, this department may have jurisdiction on some of the routes.

Map 1-1 - Study Area - Cactus City and Blythe telecommunication sites are within study area and should be shown as "red" symbols. Electronic Hill Telecommunication Site should hereafter be referred to as "BIG MARIA", as quoted in our BLM application for site easement. Clarify Mileposts legend to be the same as symbols for "Routes Under Study".

Page 1-7 - Change "conductors" to "phases" in first sentence of last paragraph. Second sentence should read "Transposing consists of changing the relative position that each phase occupies with respect to the other two phases to negate phase-voltage imbalance."

Page 1-12 - Chuckwalla Site - Change "85-foot" to "110-foot".

Electronic Hill Site - Change "Electronic Hill" to "Big Maria" as previously noted.

Blythe Facility - Change "100-foot" to "110-foot".

Page 1-13 - Table 1-3 - In legend at bottom of table, change ** "tower addition might be necessary" to "will be necessary".

Page 1-14 - Equipment Pads - Second sentence should read "These pads will provide space for tower assembly and cranes for erection as well as for preparation of footing sites. Footing holes will be dug by augers and anchors will not be used.

Page 1-17 - Access Roads, third paragraph - Add the words "unless conditions dictate otherwise" to the end of the paragraph since access roads may be located outside the right of way due to terrain or environmental constraints. Add the word "permanent" after "No" in part (2) of the fifth paragraph. Temporary main roads may be necessary in agricultural areas.

Page 1-19 - Right of Way Layout and Surveys, change paragraph to read: If a right of way is granted, the Company will refine the preliminary centerline survey and conduct a detailed archaeological survey of the route. After the centerline survey is refined, engineering design and tower site location is completed. Certain sites can then be adjusted to resolve conflicts.

Page 1-22 - Operation and Maintenance - fourth sentence - After the words "Routine maintenance" add "at the Devers Substation", since the need for additional vehicles applies only to Devers Substation and not the transmission line.

Page 1-24 - Sundesert, first paragraph - Delete first two sentences and replace with "The Sundesert Project was suspended in May 1978, however, the Final Environmental Statement is being prepared for issuance in late 1978."

Third sentence - Change "has" to "had".

Page 1-28 - Cultural, Natural and Biological Monitoring, first sentence - Delete "tower site approval and staking operation" and add "tower site and access road approval along the route prior to construction".

CHAPTER II

Page 2-6 - Accidents and Environmental Health - All four paragraphs should be included under "Air Quality and Noise", Page 2-2. Is the word "Accidents" necessary? The word "physical" would be more appropriate.

Page 2-13 - Table 2-4 - Change "vravelly" to "gravelly" in fourth grouping in Surface Textures column.

Page 2-14 - Third line from top - Change "Map 2-5" to read "Map 1-1", which is milepost map.

Page 2-25 - First paragraph - Change "corridor" to "study area" and delete "proposed". Second paragraph and Page 2-26, fifth paragraph - The Foxtail Cactus does not occur within the proposed (Brenda) transmission line corridor as stated in these two paragraphs but rather within the Kofa Route.

Page 2-26 - Fourth paragraph - Change "have been located within or very near the proposed corridor" to "have been located within the study area".

Page 2-34 - Second paragraph, fourth sentence - Delete first two sentences and replace with "The Sundesert Project was suspended in May 1978, however, the Final Environmental Statement is being prepared for issuance in late 1978."

Page 2-37 - Third paragraph - Table 2-12 lists estimated visitor use on California desert areas and not recreation sites and major recreation areas, as stated.

Last paragraph - Change "along the routes" in the second line, to read "within the study area", since all the sites mentioned are not along the routes.

Page 2-46 - Visual Resources - The text writeups for class I and II areas do not agree with Map 2-13.

Page 2-48 - Cultural Resources - This section is too specific and should be revised to discuss the study area. Also, route and corridor are not always named and sub-alternates are discussed. Examples are as follows: 1) Page 2-47, Paragraph 4, "Corridor" - Brenda or Kofa? 2) Page 2-49, Paragraph 3, there are a number of references in this paragraph to corridors but none specify what sites are in which corridor.

Page 2-60 - Community Infrastructures, third paragraph, third sentence - Change "along the transmission line" to read "in the study area".

Page 2-68 - Fourth paragraph, line 4 - Change "inevitable" to "likely".

CHAPTER III

Page 3-1 - Air Quality - The first sentence is misleading and should be revised. Dust will only be created where the work activity takes place, along the access road and at the tower sites. However, the nature of line construction is that each activity takes place in sequence and moves along the line length. Therefore, it is doubtful whether a decrease in air quality will occur along the entire line length for the entire 16½ month period, as this sentence implies.

Page 3-2 - Noise, first paragraph - Change "throughout the project region" to "along the transmission line right of way". Noise will only increase at specific areas along the right of way due to construction activities, not in the entire project region. Second paragraph - Delete the words "corona discharge" from the second sentence. Noise from corona discharge occurs only during inclemente weather and is not associated with maintenance patrols.

Page 3-4 - Sixth line from top - Add the word "within" after "limited to" for clarity. Second paragraph, last sentence - Change to "Construction noise related to...."

Surface, second sentence - Revise to read "the three major dry lakes in the study area (Ford, Palen, and Hayfield) are known to have filled with water recently.

Page 3-16 - Third paragraph, line 3 - The Foxtail Cactus does not occur on the proposed (Brenda) route. Specify corridor.

Page 3-20 - Mammals, paragraph 1, ninth sentence - Change to "Sheep, deer and other wildlife may be stressed when frightened away...."

Page 3-23 - Sixth line from top - The Brenda Route could not easily bypass the proposed natural areas in the Eagletail Mountains and Mecca Hills, as stated.

Page 3-24 - Recreation Resources, second paragraph, lines 2 and 3 - Change "destroy" to "affect" to maintain reporting objectivity.

Page 3-31 - Second paragraph - The proximity of Shavers Summit Airfield to the corridor does not constitute a hazard; therefore, the words "and its proximity could make this airfield hazardous" should be deleted. All towers near airfields will be located in accordance with FAA safety criteria. In addition, this paragraph later explains that because the corridors parallel the runway, impacts are minimized, thus removing the alleged hazardous situation.

ROADS - Change "will" to "may" in second sentence. Construction techniques in most cases allow traffic to continue by use of guard poles and netting at highway crossings.

Page 3-37 - Figure 3-6 - The towers depicted should have a vertical scale, as the largest tower could be interpreted to be 2½ miles in height.

Page 3-51 - Sixth paragraph - The words "study area, corridor, and proposed corridors" are used interchangeably. It is suggested that this paragraph be more specific as to what corridor is being discussed.

Page 3-68 - Fourth paragraph, third line - Change "the remainder of" to "previously in this Chapter".

CHAPTER IV

Page 4-6 - Third paragraph - After the word "ushered" add the words "by applicant".

Page 4-8 - Recreation, first paragraph - The specific holiday periods must be defined (days and hours) for each area listed, in order for contractors to bid the job. Also, distances from each area must be specified for the limiting of construction activities. Significant amounts of layoff time may alter the overall construction schedule.

CHAPTER V

Page 5-1 - Air Quality and Noise, first paragraph - Delete the words "corona discharge". Noise from corona discharge occurs only during inclement weather and is not related to construction but to operation.

Page 5-3 - Land Use, second paragraph - Change "will" to "may". Fourth paragraph - Change "will" to "may". See comment for page 3-31, Roads.

CHAPTER VII

Page 7-2 - Soils - Change "temporarily" to "permanently" in table in third paragraph.

Page 7-4 - Socioeconomic Conditions - Change "$54 million" to "$117 million" to properly reflect the cost of the project.

CHAPTER VIII

Page 8-4 - Subalternate Routes - Change "Maps 8-1, 8-2 and 8-3" to read "Maps 8-2, 8-3 and 8-4" and the word "alternatives" changed to "subalternatives" in third sentence, first paragraph.

Subalternate G-H - Change "Map 8-1" to read "Map 8-2" in third sentence, first paragraph.

Page 8-9 - Subalternate Routes D-E-F - Change "Map 8-2" to read "Map 8-4" in first sentence, second paragraph.

Subalternate Route P - Change "will" to "may" in next to last sentence. It cannot be determined at this time if there will be interference with agricultural work, as a line survey and tower sites have not been located.

Page 8-10 - Subalternate Route C - Change "east" to "south" in first line. Change "Map 8-1" to "Map 8-2" in last line.

Map 8-4 - The letters "j" and "k" have been left off the impact table in the lower analysis.

CHAPTER IX

Page 9-1 - Fourth paragraph - Change "July or August" to "September".

GLOSSARY

Page G-4 - Double Circuit - Definition should be changed to read, "Two electrical circuits constructed on a single tower structure."

Page G-11 - Utility Corridors - A utility corridor may also be defined as used by only one utility such as all gas pipelines or all transmission lines.

Page B-3 - Bibliography - Add reference: Southern California Edison Company, 1977. Devers-Palo Verde 500 kV Transmission Line Environmental Report Supplement 2, Harquahala-Tonopah and Yuma Proving Ground, December, 1977.

25-1 For graphic purposes, it was not possible to show the exact centerline of the powerline, particularly since the final survey is not completed and approved. However, the reason for analyzing the impacts within a mile either side of the map centerline was to allow flexibility to adjust the final centerline to avoid sensitive areas or meet critical junction points. Both of these end points can be adjusted to the correct tie-in locations while remaining within the analyzed corridors.

25-2 Text revised to reflect this possibility, see chapter 1.

25-3 Experience on similar powerline projects has shown that 1 acre more accurately reflects the disturbed area around concrete batch plants. One-half acre will accommodate the plant itself, but not the vehicle traffic and material stockpiles adjacent to the plant.

25-4 Except for a few small mammals and reptiles, very little use can be made of the area under a tower and for a certain distance outside the footings. Consequently, the entire area under the tower must be considered permanently occupied, not just the four 25-square foot footings. A 50- by 50-foot area (2,500 ft^2) was used for analysis purposes.

25-5 Text revised in chapter 1 to use applicant's wording. However, no change in meaning is noted, since the wording commits applicant to restrict activities during reproductive activities of bighorn sheep and within 1 mile of active raptor nests. This would include lambing and nesting seasons, as well as breeding seasons.

25-6 Text revised, see chapter 1.

25-7 Text revised, see chapter 1.

25-8 The identified impacts would be expected no matter who constructs the new road. However, the cumulative impacts of the two rights-of-way will be significantly reduced if a common access road is used.

25-9 It was felt that access would be improved by upgrading the existing road. If the road is not upgraded and the transmission line is located south of the existing road and transmission line, expected impacts would be reduced.

25-10 This rating was developed by the Sundesert ES Team, based upon an existing National Recreation Lands Designation and crossing of a major access road to the Wiley Well Campground. Heavy visitor use also contributed to the impact rating (39,000 visits per year, 97,000 visitor days).

25-11 The impact rating considers the designated BLM Recreation Site (La Posa) and the fact that the "undeveloped natural setting" is the reason most often given by visitors for preferring the La Posa Recreation Site. The text has been revised to include the Orocopia Mountains-Corn Springs area. See chapter 3.

25-12 Reference corrected to Sundesert FES, 1978. The report only specifies agricultural aircraft. Whether they were actually involved in crop dusting at the time does not change the fact that agricultural aircraft legally fly at altitudes which make powerlines an occupational hazard, especially at night or during early morning or late evening hours.

25-13 The entire Wilderness Sections of chapters 2, 3, 4, and 8 have been rewritten to reflect the most recent information available at this printing. The BLM Wilderness review is an on-going process and it is very possible that changes will be made after publication of this document. The decision must be based on the latest information available at the time.

25-14 The apparent corridor between PWSAs 2, 3, and 4 is a result of graphic separation. The actual boundary of each area is the road. See chapter 1 - INTERRELATIONSHIPS and chapter 3 - WILDERNESS.

25-15 See response No. 13.

25-16 The El Paso Natural Gas pipeline road is the boundary of the Proposed Wilderness Study Area.

25-17 Visual impacts were assessed using BLM's Visual Resource Management Contrast Rating System. Visual impacts are subdued in this area by the existence of a number of man-made intrusions, i.e., roads, 161 or 230 kV powerline, buildings, etc.

25-18 Visual impacts were assessed using BLM's Visual Resource Management Contrast Rating System. The statement is correct using the system, but the text has been revised to recognize the short duration of the impact to motorists.

25-19 San Diego Gas and Electric has not officially withdrawn its application to BLM and NRC, even though they have suspended action with the State of California. Therefore, it must be assumed that the plant and transmission lines could be pursued at some time in the future. The Sundesert ES has been finalized in October of 1978.

25-20 See previous response.

25-21 Text revised, see chapter 3.

25-22 Table revised. See table 3-8.

25-23 The intent of this mitigating measure is to avoid opening a new main access road through the area which would directly and indirectly impact bighorn sheep and the plant community by encouraging increased vehicle traffic. The area contains several existing north-south roads which may be used for construction access. If this corridor is chosen, short spur roads to individual tower sites may be permissible, depending upon proposed locations. Flexibility is afforded the applicant to propose alternate construction methods to meet the intent of the measure. Temporary access roads are usually not effective in this desert area, however, since the scar heals very slowly, and ORV users will continue to travel the roads despite attempts to close them.

Pulling and tensioning sites may be located on or near the existing roads.

25-24 Text revised for clarification, see chapter 4.

25-25 Text revised. The reference should have been Palm Oases, indicating all of the oases located along the 8-mile stretch from milepost 209 to 217. Also see response No. 9.

25-26 Text revised for clarification.

25-27 Text revised for clarification. The intent is to provide one additional watering facility on the opposite side of the transmission line from the one being impacted. This will afford animals approaching from both sides an opportunity to water during construction, maintenance, and public use of the roads.

25-28 Nonspecular conductors will be required on all lands administered by BLM to reduce visual impacts on scenic resources. Weather conditions in the Southwest Desert areas are not conducive to rapid weathering of conductors.

25-29 Applicant committed mitigation measures for cultural resources (pages 1-35, 36; DES) in chapter 1 are rather general in nature, and do not define specific parameters for on-the-ground inventory work. Paragraphs 2a through 2c of page 4-9 (DES) are included in chapter 4 to provide additional cultural resource inventory guidelines.

Paragraph 2a, which specifies a 400-foot-wide (61 m) corridor for inventory, follows the standard set for previous cultural resource inventory work along the subject corridors. To remain consistent, this standard should be continued for future inventory work. Experience has shown that impacts do occur beyond the right-of-way.

Paragraph 2b (like paragraph 2a) requires the inventory of a 100-foot-wide (30.5 m) surface area beyond the actual construction-related facility areas to provide a buffer zone for unexpected impacts which may occur (1) during construction, or (2) resulting from all types of surface disturbing activities which may occur during the post-construction period. Experience has demonstrated that a 100-foot buffer zone requirement for cultural resources inventory work is not unreasonable. Meeting the requirements of paragraph 2a will normally satisfy the requirements of paragraph 2b, except where access roads, construction yards, etc., will be located outside the right-of-way.

Paragraph 2c requires inventory of all culturally sensitive areas (especially potential National Register Sites) which extend beyond the 400-foot-wide (122 m) corridor or construction area for the following reason. Most archaeological sites are somewhat atonomous, internally self-contained, or continuous units which can be properly studied only by study of the whole unit. Therefore, it would be inadequate to study, e.g., only that portion of the Jagow Well Site which may possibly lie within the finally selected right-of-way, while ignoring the rest of the site.

ARIZONA DESERT BIGHORN SHEEP SOCIETY INC.

P. O. Box 5241 • Phoenix, Arizona 85010

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October 16, 1978

Mr. Robert O. Buffington,
State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Az. 85073

Dear Mr. Buffington:

The Arizona Desert Bighorn Sheep Society would like to reaffirm its stand on the proposed routing of power lines from the Palo Verde Nuclear generation site to California. If federal agencies continue to propose projects that will undoubtedly have primary and secondary impacts on desert bighorn sheep populations, this resource will slowly disappear and eventually become federally listed. Consequently, we ask that BLM only consider powerline routes that will have the least impact on sheep.

26-1

If the BLM does not use good judgement in this matter, the Society is prepared to join with other conservation agencies in order to prevent powerlines and secondary access to some of the most valuable sheep habitat in Arizona.

We oppose any powerline route through the Bureau of Land Management lands. But, if a route has to be, we would consider and possibly support the route selected by the sighting committee. Construction across the Dome Rocks should be done totally by helicopter with no access roads. Secondary impacts on sheep are as bad, if not worse, than primary ones.

Sincerely yours,

Jerry Petkovsek
President

26

Response:

26-1 Your recommendation is noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

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Project #D-BLM-K08005-AZ

Mr. Buffington
Bureau of Land Management
Arizona State Director
2400 Valley Bank Center
Phoenix AZ 85073

19 OCT 1978

Dear Mr. Buffington:

The Environmental Protection Agency has received and reviewed the draft environmental statement for the PALO VERDE DEVERS 500 KV TRANSMISSION LINE.

EPA's comments on the draft environmental statement have been classified as Category LO-1. Definitions of the categories are provided on the enclosure. The classification and the date of EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and the adequacy of the environmental statement.

EPA appreciates the opportunity to comment on this draft environmental statement and requests three copies of the final environmental statement when available.

If you have any questions regarding our comments, please contact Betty Jankus, EIS Coordinator, at (415)556-6695.

Sincerely,

Paul De Falco, Jr.

Paul De Falco, Jr.
Regional Administrator

Enclosure

cc: Council on Environmental Quality
A-104, Florence Munter

27

Radiation Comment

1. (DEIS, Summary page 3 item h)

27-1 The unit rem does not stand for "radiation exposure months." It is roentgen-equivalent man or mammal; it is a special unit of radiation dose equivalent. Person-rem or man-rem denotes a population exposure, and a one rem/yr. exposure to 1,000 people would be 1,000 person-rem/yr.

27-2 The comparison of the dose to the population affected by the Palo Verde Nuclear Generating Station (156 man-rem/yr) and the man-rem exposure from naturally occurring or background radiation to the entire population of the United States is not a valid comparison, since these are not the same groups. This statement should be revised to compare the exposure in the same population group, and a statement reflecting the comparison of the operating dose calculated to the EPA Uranium Fuel Cycle Standard should be made to indicate expected compliance.

EIS CATEGORY CODES

Environmental Impact of the Action

LO--Lack of Objections

EPA has no objection to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER--Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EU--Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1--Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2--Insufficient Information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3--Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement.

If a draft impact statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

Response:

27-1 Text revised.

27-2 This comment refers to summary of FES and FSFES on Palo Verde Nuclear Generating Station, not to this ES. Only the underlined portions of the NRC Summary and Conclusions were changed to reflect this proposal.

TONOPAH VALLEY ASSOCIATION

P. O. BOX 103 TONOPAH VALLEY, ARIZONA 85354

LAWRENCE H. HEISLER — Chairman
CHARLES BIGELOW — 1st Vice-Chairman
MILDRED RUHLE — 2nd Vice-Chairman
JOE BULFER — 3rd Vice-Chairman
DORIS M. HEISLER — Secretary-Treasurer

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October 20, 1978

STATE DIRECTOR
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Sir:

Enclosed please find a copy of the Statement that I presented orally at the B.L.M. Public Hearing of September 26, 1978, at the Board of Supervisors Auditorium, Phoenix, Arizona, concerning the B.L.M. Draft Environmental Statement on the Palo Verde - Devers 500 Kv Transmission Line.

Due to short notice of the public hearing, much of my statement was hand-written at that time; therefore, was not turned in to the court reporter at the hearing for your records.

We hope that you will allow us to file additional remarks, if desired, after we have been able to more fully analyze the documents.

Thank you,

TONOPAH VALLEY ASSOCIATION

Doris M. Heisler

Doris M. Heisler,
Secretary-Treasurer

DMH/

Encl: Statement

cc: Burch, Cracchiolo, Levie, Guyer & Weyl, P.A.

28

STATEMENT OF DORIS H. HEISLER
Secretary-Treasurer
Tonopah Valley Association

INTRODUCTION

The Tonopah Valley Association was formed approximately two years ago in 1976 for the express purpose of guiding the future development of the Tonopah Valley in order to maintain and promote conservation and natural beauty in the Tonopah Valley area, to protect the environment, to preserve the historical sites, and to promote the orderly development of the area of the Tonopah Valley.

This testimony summarizes the feelings of a majority of the residents and landowners of the Tonopah Valley, and represents a consensus of opinion based upon a broad series of community meetings and private investigations relating to the impact of the proposed 500 Kv power transmission line between Palo Verde Nuclear Generating Station near Wintersburg, Arizona, and the Devers Substation near Palm Springs, California, particularly as that impact affects the Tonopah Valley and related areas.

Our association has met with representatives of Southern California Edison Company, representatives of various governmental agencies, and we have received from said parties voluminous material relating to the transmission line, and the various proposed routes Southern California Edison Company has requested.

1. It is our opinion that the best route for Southern California Edison to follow for the benefit of the residents and landowners, in both the Tonopah Valley and the Harquahala Valley, adjacent to us, would be the southerly route coming west from the Palo Verde Nuclear Generating Station, proceeding to Clanton Well, turning northwest through Nottbusch Valley and going west of the Eagletail Mountains. It is designated on Southern California Edison Co. (S.C.E.) maps as route S-21, and B.L.M. maps as J-K-L. We believe that the selection of this route would do the least damage to environment and would minimize the impact of the transmission line upon adjacent wildlife and plant life, and would not affect any existing scenic areas or historical sites in the Tonopah Valley.

2. We have conferred with many of the residents of the Harquahala Valley and agree with them that route S-22 (your G-H route) and the pipeline (Brenda) route, S.C.E.'s original preferred route, would prove detrimental to those residents and landowners, although the ultimate effect on the residents and landowners in the Harquahala Valley would not be of such great impact by S-22 (G-H) route.

3. We feel that routes S-23 (your D-E route), passing between the Palo Verde Hills and Saddle Mountain, along the east side of Saddle Mountain, over Interstate 10 freeway and around Burnt Mountain on the north, then extending westerly along the Central Arizona Project and crossing it at several points, then recrossing Interstate 10 further west; route S19 (your A-B route) coming north out of the Plant to the vicinity of Interstate 10 and following I-10 across the town of Tonopah; and the S-18 (your Kofa) route coming north out of the Plant and following Salome Road in a northwesterly direction have major disadvantages, and would have very adverse impacts upon the residents and landowners of the Tonopah Valley, and we set forth herein a number of reasons supporting this position.

(1) There is some archeological sensitivity between the Palo Verde Hills and Saddle Mountain which might be detrimentally affected.

(2) The east side of Saddle Mountain is presently being considered by the Bureau of Land Management as a potential wilderness or roadless area, and construction of the transmission line under route S-23 (your D-E) would diminish the possibilities of this occurring.

(3) We are informed that both county, state and federal agencies are considering Saddle Mountain for a potential park area. It is also presently a favorite area for rock hunting and hiking activities, and is considered an area of very high scenic value for the local residents, many of whom have moved to this area to enjoy the beauty of the surrounding mountains and desert terrain.

(4) The line would cross a number of private properties interferring with the existing uses of the land presently enjoyed by the owners.

(5) There would be a severe visual disturbance to Interstate 10 traffic and Salome Highway traffic on any of the three routes proposed in our area, which presently has an undisturbed scenic view, and this would have a particularly detrimental effect at Burnt Mountain and the Burnt Well rest area. Additionally, the line on route S-23 (your D-E route) would cross Interstate 10 at two points along the route.

(6) Soil erosion presently exists in some areas adjacent to the Northern Harquahala Plains, and construction of the S-23 (your D-E route) and S-19 (your A-B route) and S-18 (your Kofa route) could aggravate this situation.

(7) Water depletion has caused an unstable soil condition in the northern part of the Harquahala Plains area, and there are presently some major areas of fissures. Heavy construction equipment, the construction of towers, etc. in this area would certainly result in additional damage to that presently existing.

-2-

(8) We are informed that an electronic communication system will govern the flow of water along the Central Arizona Project canal and that there may be possible interference with that system by reason of construction of Route S-23 (your D-E route) adjacent to the canal area. S-23 (D-E) would also cross the Central Arizona Project canal at several points.

(9) Major access roads would have to be constructed to service the S-23 (D-E) route, which we believe would be an invitation for indiscriminate use by four-wheel drive vehicles, trail bikes, etc., to the detriment of the total area.

(10) Route S-23 (D-E) would also cross the coaxial cable of American Telephone and Telegraph Company, which may present a concern for their communications system.

(11) According to the Federal Aviation Agency, aircraft may utilize Interstate 10 highway for navigational purposes in inclement weather, and with route S-23 (D-E) crossing the freeway at two points, and S-19 (A-B) parallelling Interstate 10, the aircraft could conceiveably operate in close proximity to the power lines thus presenting a danger to the aircraft and pilots.

(12) The Flood Control District of Maricopa County has stated that Route S-23 (D-E) may pose a possible conflict with their Harquahala Valley Flood Retarding Structure.

(13) West Indian School Road in the Tonopah Valley was previously named and is still shown on some maps and addresses in the area as Airline Road, because it serves as a navigational guide path for flying aircraft. Any towers crossing Indian School Road or aligning it or Interstate 10 at any point in the northern part of Tonopah Valley could endanger the safety of the aircraft and pilots. Routes S-23 (D-E), S-19 (A-B), and S-18 (Hofa) could all greatly affect it.

(14) The S-19 (A-B) route would prove very detrimental by disturbing populated areas at Wintersburg, by passing through three sub-division units along Interstate 10, and by crossing through the downtown business area of Tonopah, thereby hampering growth and development, and depreciating property values and quality of living.

(15) The Hofa route would very detrimentally affect our area by passing through populated areas at Wintersburg and further northwesterly, would cross agricultural lands thus hampering farming processes and jeopardizing the safety of crop-dusting pilots and planes -- enhancing that danger even more by diagonalling those areas rather than running parallel with the crops, thus lessening the judgement of the pilots to the towers and lines. It would also pass

in close proximity to two or more landing strips presently in use, endangering pilots and planes at take-off and landing procedures.

(16) The Kofa (S-18) and A-B (S-19) routes would both parallel roadways currently being used by motoring traffic, and would greatly lessen the quality of their scenic viewing pleasure and of the local residents.

(17) Many of the previously mentioned detriments of Route S-23 (D-E) also apply to the A-B (S-19) and Kofa (S-18) routes.

There is only an approximate 2-mile wide area of land between the Salome Road and Interstate 10, near Tonopah and on West. If a 2-mile wide corridor is being considered for either the A-B (S-19) route or the Kofa (S-18) route, it would include all of the urban and agricultural lands in that vicinity, and would promote destruction for the Town of Tonopah and adjoining areas.

4. We are very concerned that any power lines are being considered to pass through any area north of the Palo Verde Nuclear Plant in Tonopah Valley. We are already so highly impacted by the Palo Verde Nuclear Generating Plant itself which encompasses approximately 4,000 acres of land; by the existence of Interstate 10 Highway; by the Central Arizona Project canal presently under construction 7 miles north of Tonopah; by the two sets of Salt River Project 500 Kv transmission lines to be constructed through our Tonopah Valley east thence northeast and east thence southeast from the Nuclear Plant; and by the Pipeline to be constructed from the Palo Verde Nuclear Plant east to Phoenix, Arizona, through the Tonopah Valley to carry sewage waters to the Plant for cooling of the nuclear reactors. We feel that any further impacting of our area would greatly hamper the growth and progress of our Valley, would depreciate property values, would limit the private and public useage and enjoyment of the land, would destroy the scenic beauty of the area, would affect physical and mental stress upon local people, and would restrict proposed future agricultural, commercial, and residential useage of some lands.

5. We are opposed to the change in the application by Southern California Edison Company from their mile-wide corridor to a two-mile-wide corridor. However, if the B.L.M. and the Siting Committee deem it necessary for a two-mile-wide corridor to be granted, we strongly request that the corridor expand to the south and to the west of S.C.E.'s original proposed center line.

6. It is not apparent to us how it can be advantageous to anyone to go in a northerly direction with a route to reach a westerly destination.

In summary, we state again, the best route is that Southerly Route designated as S-21 (B.L.M. route J-L-1) and will support the same, and voice our opposition at the hearing to the others as set forth above.

We represent approximately 3,000 landowners and residents in our area. Also, submitted and attached hereto as a part of this presentation are 907 petitions containing 1,508 signatures of our area landowners and residents in protest to routes S-23 (D-E-F), S-19 (A-B), and S-18 (your Kofa route), and in support of Routes S-21 (J-K-L) or S-22 (G-H). The petitions could not determine the routes by numbers or letters, since the routes had not as yet been designated names, numbers, or letters when the petitions were gathered, only routes and descriptions shown on maps.

We feel that we are not being listened to as citizens, and are being denied our constitutional rights of life, liberty, and the pursuit of happiness. This B.L.M. Statement Draft has seemingly ignored our voiced opinions both written and oral as to the detriment of any more impact to our area by power lines. We had convinced Southern California Edison Company and the Transmission Line & Siting Committee as to the detriment of these lines to our area, and S.C.E. was granted a southerly route (S-21) - your J-K-L route-as the best route to project power from the Palo Verde Nuclear Generating Station to Devers Substation in California. Since that time, B.L.M. has attempted to block that southerly route with potential wilderness areas needing further study for 12 to 15 years. We have been in contact with our representatives in Washington D.C. about these power line routes, and are sending them a copy of our testamonies and our petitions.

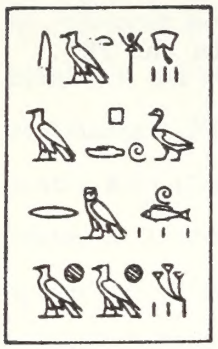
This concludes my presentation. Hopefully, the material which has been presented to the Committee has given you in summary form sufficient information as to the concerns of the citizens as landowners and residents of the Tonopah Valley.

Thank you.

Response:

28-1 The impacts you have noted have been addressed in the FES.

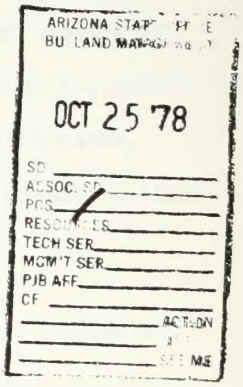
29



THE WILDLIFE SOCIETY

ARIZONA CHAPTER

P. O. BOX 35414 PHOENIX, ARIZONA 85069



October 25, 1978

Mr. Robert O. Buffington
Arizona State Director (911)
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

These brief comments are in regard to the Draft EIS for the Palo Verde-Devers 500 kv Transmission Line. Our general impression is that this draft statement adequately addresses probable impacts on the wildlife resource, though we have questions and comments on a few items.

29-1 We note that application has been made for the fourth and fifth units at the Palo Verde Nuclear Generating Station. Because a second transmission line will be required in the future, we suggest double-circuit rather than single-circuit towers be installed (p.4-3). This action now could reduce overall disturbance tied to additional construction in the future.

29-2 On page 2-28 the Draft EIS suggests that desert bighorn sheep are restricted to the "highest mountain terrain." This is often not the case, for bighorn rams habitually avoid the roughest terrain and focus many of their activities in the surrounding foothills. Also, all age and sex classes of sheep will move to more gentle terrain when rainfall stimulates plant growth on lower elevations. It is also documented that individual bighorn sheep, as well as groups, will move many miles across desert lowlands when traveling between mountain ranges.

We recognize that installations along the Kofa Route will have unfavorable visual impacts in an area with potential for wilderness designation. However, we believe the project will impact the wildlife resource less if construction follows the corridor established by the existing El Paso Gasline through the Kofa Game Range. Our first concern is for the resource and our second concern is for the user.

As far as the Brenda Route is concerned, we feel that following the G-H subalternative on the east end of the route will avoid most cultivated areas and impact the Eagletail Mountains much less than the J-K subalternative.

The mitigation proposed by Southern California Edison in Chapter 1 will certainly help offset the losses of wildlife.

We appreciate the opportunity you have provided for us to comment on the Draft EIS for the Palo Verde-Devers Transmission Line.

Sincerely,

Bob Barsch

Bob Barsch
Executive Board Member

BB:dd

Response:

29-1 See chapter 3, IMPACTS OF A SECOND 500 KV TRANSMISSION LINE.

29-2 Text revised. See chapter 2 - MAMMALS.

Arizona State Clearing House Letter No. 30

The form on the following page was forwarded by the Arizona State Clearing House to the agencies listed. Arizona Game and Fish Department responded by separate comments, see Letter No. 14. The remainder of the agencies either had no comment or supported the proposal as written. The form from the Arizona Bureau of Geology and Mineral Technology is presented as an example of the latter.

The following agencies responded either with no comment or supported the statement as written:

Arizona Bureau of Geology and Mineral Technology, U of A
Center for Public Affairs, ASU
District #4 Council of Governments
Arizona Atomic Energy Commission
Arizona Historical Society
Arizona State Archaeologists
Arizona Outdoor Recreation Coordinating Council (AORCC)
Maricopa Association of Governments
Department of Health Services
Department of Land
Indian Affairs Commission
State Water Commission
Oil and Gas Conservation Commission
Agriculture and Horticulture Commission
Arizona State Parks Board

30

Dr. William H. Dresher, Director
Arizona Bureau of Geology &
Mineral Technology
University of Arizona
Tucson, Arizona 85721

State Application Identifier (SAI)
SEP 12 1978 State AZ Number 78-80-0048

Az Bu of Geology & Mineral Tech.
Oil & Gas Cons Comm — Power
Az Atomic Energy Comm — Water
Az Historical Society — Land
Corporation Comm — Health
Az Mining Assoc — AORCC
Indian Affairs — Parks
Environmental Studies — Ag & Hort
Archaeological Research — Region I & I
Center For Public Affairs — OEPAD-
Renewable Natural Resources — R. Kinge
Civil Rights
Solar Energy
Energy Programs
Mineral Resources
Game & Fish
Transportation

rom: Arizona State Clearinghouse
1700 West Washington Street, Room 505
Phoenix, Arizona 85007

his project is referred to you for review and comment. Please evaluate as to:

(1) the program's effect upon the plans and programs of your agency
(2) the importance of its contribution to State and/or areawide goals and objectives
(3) its accord with any applicable law, order or regulation with which you are familiar
(4) additional considerations

ase return THIS FORM AND ONE XEROX COPY to the clearinghouse no later than 17 working days from the date noted above.
ase contact the clearinghouse if you need further information or additional time for review.

☐ No comment on this project
☒ Proposal is supported as written
☐ Comments as indicated below

omments: (Use additional sheets if necessary)

30-1 We are very pleased with the completeness of this statement particularly inasmuch as the authors did perform an adequate assessment of the geologic nature of the region including mineral resource occurrences and geological hazards. This agency supports the proposal as written and wishes to compliment the BLM and the authors of this statement for their thoroughness.

eviewer's Signature W. H. Dresher Date 9/22/78

itle DIRECTOR Telephone 626-1943

LAW OFFICES
BURCH, CRACCHIOLO, LEVIE, GUYER & WEYL, P.A.
2333 NORTH CENTRAL AVENUE · PHOENIX, ARIZONA 85004 TELEPHONE (602) 252-7701

FRANK HAZE BURCH
PAUL D. LEVIE
KENNETH C. WEYL
JAMES B. CROOK, JR.
STEPHEN E. SILVER
JOHN F. DAY
ARDA S. RUTHERFORD
JACK DANIEL KLAUSNER
J. LAWRENCE McCORMLEY
AMY S. FISHER
ROGER K. SPENCER

DANIEL CRACCHIOLO
ROBERT A. GUYER
C. MICHAEL PIERCE
MICHAEL E. BRADFORD
BARRY A. MacBAN
BRIAN KAVEN
DUANE A. OLSON
JERRY L. COCHRAN
DANIEL P. JANTSCH
FREDERICK C. CREASY, JR.

PHOENIX OFFICE
MAILING ADDRESS
P. O. BOX 13528
PHOENIX, ARIZONA 85002

SUN CITY OFFICE
BELL PLAZA PROFESSIONAL BLDG.
10451 PALMERAS DR.
SUN CITY, ARIZONA 85373
(602) 974-4796

October 27, 1978

Received (Hand Carried)
10-27-78
3:45 PM

State Director (911)
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Re: Draft Environmental Statement Palo Verde-Devers 500 KV Transmission Line

Dear Sirs:

This firm represents Tonopah Valley Association and makes the following comments on behalf of this Association.

31-1 The Draft Environmental Statement seriously neglects the sociological impacts of the proposed action. It fails to set forth the probable adverse effects on the Tonopah Valley residents if a northern route is adopted rather than the JKL. This statement does not attempt to balance or consider the relative effects on, i.e., quality of life for Indian children living in foster homes in the Tonopah Valley vs. effect on archaeological sites; effect of increased traffic on children walking to school or bus stops vs. effect of a highline road on the Coachella Valley fringe-toed lizard; or the effect of visual pollution in the Tonopah Valley from one and eventually four transmission lines vs. effect of the same number of transmission lines on an uninhabited and not particularly attractive desert terrain.

31-2 The population figures used for the Tonopah Valley are severely outdated, as is other demographic data.

It is the opinion of the Tonopah Valley Association that the BLM has gone out of its way to foreclose any meaningful consideration of alternatives by belatedly declaring wilderness areas after hearings and investigation revealed that the most likely and least disruptive route was the southern route known as alternate JKL.

In conclusion, the Draft Environmental Statement for the Palo Verde-Devers 500 KV transmission line is deficient in that it contains erroneous data concerning the 31-3 Tonopah Valley, fails to sufficiently consider the impact on the people of the Tonopah Valley and fails to adequately consider the JKL alternative.

The Statement lacks perspective in that it protects 31-4 sanddunes and lizards at an extreme cost to a beautiful environment and the quality of human life.

It should be noted that any opinion expressed by or on behalf of the Tonopah Valley Association is not one opinion, but rather 3,000 opinions, as that is the number of landowners represented.

Very truly yours

Arda S. Rutherford
FOR THE FIRM

ASR/emf

HAND DELIVERED
10-27-78

CC: Congressman Bob Stump

Response:

31-1 Socioeconomic impacts and visual impacts have been addressed in chapter 3. The purpose of the environmental statement is not to balance impacts, but to identify those which would occur if the project or its alternatives were constructed. A balancing or trade-off of impacts is the function of the decision making process following completion of the final environmental statement.

31-2 Population figures are constantly changing. The figures used in the Draft Environmental Statement were taken from the most recent published census and have been updated based on Report No. 10 from the Arizona Department of Economic Security, see table 2-17.

31-3 See response to 31-1 and 31-2.

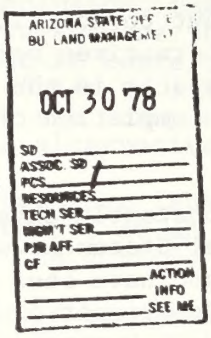
31-4 See response to 31-1.

32

C-VAG

COACHELLA VALLEY ASSOCIATION of GOVERNMENTS

County of Riverside
Coachella • Desert Hot Springs • Indio
Palm Desert • Palm Springs • Rancho Mirage



October 27, 1978

Mr. B. Buffington,
Arizona State Director (911)
BUREAU OF LAND MANAGEMENT
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

On September 29, 1978, the CVAG Executive Committee reviewed the A-95 Clearinghouse listings of Grant Applications emanating from the Coachella Valley. Concern was raised about a Draft Environmental Impact Report prepared by the Bureau of Land Management regarding a proposal by Southern California Edison to construct a set of 500 Kv transmission lines from the Palo Verde Nuclear Generating Station near Buckeye, Arizona, to the SCE Devers Substation near Palm Springs.

The Executive Committee considered the two preferred SCE transmission line routes, the Kofa route which would run north of the Indio Hills and the Brenda route, which would run south of the Indio Hills. The Executive Committee was reluctant to endorse either of the two routes without greater knowledge of the project's impact, so the matter was referred to the CVAG Environmental Committee for consideration.

The Executive Committee reviewed the proposed construction of the transmission lines again on October 24, 1978. On the basis of input from the CVAG Environmental
32-1 Committee, the Executive Committee recommends that Southern California Edison consider a third alternative route for the proposed transmission lines. This route would run north of Joshua Tree National Monument and through San Bernardino County. It was the finding of the CVAG Executive Committee that the location of transmission lines along either alignment proposed for the Coachella Valley would have an adverse impact.

The CVAG Executive Committee recognizes that this route would involve approximately one hundred additional miles of transmission lines. However, CVAG believes the impact the transmission lines would have on the character and the environment of the Coachella Valley is substantial enough to warrant careful consideration of the third alternative route.

Thank you for your consideration of this matter.

Very truly yours,

Gary Wiedle

GARY WIEDLE
Executive Director

CC: State Energy Commission
Brian Farris, Southern California Association of Governments

74-133 El Paseo, Palm Desert, Calif. 92260 • (714) **346-1127**

Response:

32-1 Your recommendations are noted.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Ecological Services
2934 W. Fairmount Avenue
Phoenix, Arizona 85017

October 30, 1978

ARIZONA STATE OFFICE
BU. LAND MANAGEMENT
OCT 31 78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER
RSRV'T SER
PUB AFF
CF
ACTION
INFO
SEE ME

Mr. Robert O. Buffington
Arizona State Director
Bureau of Land Management
2400 Valley Bank Center
Phoenix, Arizona 85073

Dear Mr. Buffington:

We have reviewed the draft environmental statement EC 78-43 for the 500 KV transmission line from the Palo Verde Generating Station to Southern California Edison's Devers Substation.

The draft EIS adequately discloses the probable environmental impacts the proposed action and its alternatives would have on the fish and wildlife resources in the project area. However, we have the following specific comments.

The Fish and Wildlife Service still maintains the position that the Kofa route through the Kofa National Wildlife Refuge is incompatible with refuge objectives and is not an allowable development on the refuge. This position was stated in a January 10, 1978 letter to Mr. Karl L. Kipping, Bureau of Land Management, Yuma, from Refuge Manager Monte M. Dodson.

33-1 Page 1-17, Access Roads

Construction and maintenance roads in the mountainous areas along the proposed right-of-way should not be built, and helicopters should be used for all construction and maintenance. These mountain areas are extremely sensitive habitat for the desert bighorn sheep and new access roads and the resultant human encroachment will be the most significant impact to the sheep populations.

33-2 Page 1-28, Cultural, Natural and Biological Monitoring

The identification of specific biological problem areas during the tower site and access road approval operation should not be left up to the applicant's biologist. A team of biologists from Arizona Game and Fish Department, Bureau of Land Management, and the Fish and Wildlife Service should investigate all problem areas.

33

Page 1-34, General Mitigation Measures

33-3 If it is determined by the Bureau of Land Management that there exists possible impacts to endangered or threatened plant or animal species covered by the Endangered Species Act of 1973 (Public Law 93-202; 87 Stat. 884), the Fish and Wildlife Service must be contacted. Procedures for consultation are provided in the Interagency Cooperative Regulations in the Federal Register of January 4, 1978, Vol. 43, No. 2, pp. 870-876.

Page 1-35, Specific Mitigation Measures

33-4 Placement of watering places for bighorn sheep should be determined by a team of biologists from the Bureau of Land Management, Arizona Game and Fish Department, and the Fish and Wildlife Service and not just the authorizing agency.

Page 2-29, Birds

33-5 The statement that "a majority of birds avoid the desert" is not true. The washes within the desert provide habitat for large numbers of bird species. Also, several unique species found only in the Southwest desert include elf owl, verdin, cactus wren, Gila woodpecker, Phainopepla, Lucy's warbler and curve-billed thrasher.

Page 3-22

33-6 The impacts of the proposed transmission line on any species or groups of animals should not be evaluated based on distributions throughout Arizona and California. Rather, the effect on the populations of animals in the construction area should be evaluated. A project may affect only a small percentage of the total population of a species within a state or region, but can be disastrous or even eliminate local populations.

Although we find that this statement is generally adequate, we reserve the option to exercise other authorities such as the Endangered Species Act as conditions warrant.

The opportunity to review and comment on this EIS is appreciated.

Sincerely,

Frank M. Baucom
Acting Field Supervisor

cc:
District Mgr., BLM, Yuma
Director, AGFD, Phoenix
Reg. Dir., FWS, Albuquerque
Area Manager, FWS, Phoenix
Refuge Mgr., Kofa NWR, Yuma

Response:

33-1 These items in chapter 1 refer to proposals by the applicant, and are not necessarily stipulations to be included in a right-of-way grant, see chapter 4.

33-2 See response to 31-1.

33-3 Informal consultation with Mr. Jack Woody, FWS Regional Endangered Species Coordinator, prior to the DES indicated that no formal consultation was required based on information available at the time. If additional information indicates potential impacts to federally listed species, formal consultation under Section 7 of the Endangered Species Act will be initiated.

33-4 See response to 31-1.

33-5 Text revised, see chapter 2 - BIRDS.

33-6 The environmental statement team analyzed impacts to specific populations as well as impacts to populations in general.

34

OFFICE OF THE SECRETARY
RESOURCES BUILDING
1416 NINTH STREET
95814

(916) 445-5656

Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Navigation and Ocean Development
Department of Parks and Recreation
Department of Water Resources

EDMUND G. BROWN JR.
GOVERNOR OF
CALIFORNIA

Air Resources Board
California Coastal Commission
California Conservation Corps
Colorado River Board
Energy Resources Conservation and Development Commission
Regional Water Quality Control Boards
San Francisco Bay Conservation and Development Commission
Solid Waste Management Board
State Coastal Conservancy
State Lands Commission
State Reclamation Board
State Water Resources Control Board

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

ARIZONA STATE OFFICE
BUREAU OF LAND MANAGEMENT
NOV 1 '78
SD
ASSOC. SD
PCS
RESOURCES
TECH SER.
MGMT SER.
PUB AFF.
CF
ACTION
INFO
SEE ME

OCT 30 1978

U. S. Department of Interior
2400 Valley Bank Center
Phoenix, AZ 85073

Gentlemen:

The State of California has reviewed the "Draft Environmental Statement Palo Verde-Devers 500 KV Transmission Line" which was submitted to the Office of Planning and Research in the Governor's Office.

The State's review was coordinated with the Departments of Water Resources, Fish and Game, Food and Agriculture, Parks and Recreation, Conservation and Transportation; the Air Resources and State Water Resources Control Boards; and the Public Utilities, Energy and State Lands Commissions.

Comments by the Departments of Conservation and Fish and Game were sent to you by memoranda dated October 4, 1978 and October 10, 1978, respectively.

The DEIS recognizes that permits from the California Department of Transportation will be required for crossing State highways. It also indicates that although general guidelines for construction have been established, the applicant has not committed to specific mitigation measures. Specific mitigation measures will be determined by final location and design of transmission lines and off-site facilities. The applicant considers these design decisions to be several years away.

When the design decisions are finalized, the Department of Transportation would like the opportunity to review and comment on more specific design construction and mitigation proposals affecting our facilities.

Thank you for the opportunity to review this document.

Sincerely,

J. Frank Goodson
Assistant Secretary for Resources

cc: Director of Management Systems
Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH No. 78091213)

OFFICE OF THE SECRETARY
RESOURCES BUILDING
1416 NINTH STREET
95814

(916) 445-5656

Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Navigation and Ocean Development
Department of Parks and Recreation
Department of Water Resources

EDMUND G. BROWN JR.
GOVERNOR OF
CALIFORNIA

Air Resources Board
California Coastal Commission
California Conservation Corps
Colorado River Board
Energy Resources Conservation and Development Commission
Regional Water Quality Control Boards
San Francisco Bay Conservation and Development Commission
Solid Waste Management Board
State Coastal Conservancy
State Lands Commission
State Reclamation Board
State Water Resources Control Board

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

1978 NOV 7

RECEIVED
B.L.M. AZ STATE OFFICE
Nov 9 10 36 AM '78
PHOENIX, ARIZONA

Mr. Robert O. Buffington
State Director
Bureau of Land Management
U. S. Department of the Interior
2400 Valley Bank Center
Phoenix, AZ 85073

Attention: Mr. Art Tower

Dear Mr. Buffington:

The Resources Agency of the State of California, by letter of October 30, 1978, transmitted to the Department of the Interior in Phoenix the State's comments on your "Draft Environmental Statement Palo Verde-Devers 500 KV Transmission Line". The third paragraph of the letter stated that memoranda of the Departments of Conservation and Fish and Game had been previously sent to you.

35-1 It was brought to our attention and confirmed by a phone conversation with Mr. Art Tower of your office that receipt of the above mention memoranda had never occurred. To clarify this situation we have attached herewith copies of this memoranda which should be considered an integral part of the State's comments. I hope this discontinuity will not cause any undue problems.

Thank you again for the opportunity to review the subject document.

Sincerely,

L. FRANK GOODSON
Assistant Secretary for Resources

Attachments

35

Response:

35-1 The attachments are numbered and addressed separately, see Letter Nos. 36, 37 and 38.

State of California — The Resources Agency

Memorandum

To : 1. L. Frank Goodson, Projects Coordinator
Resources Agency

2. Bureau of Land Management
Arizona State Director (911)
2400 Valley Bank Center
Phoenix, Arizona 85073

Date: October 10, 1978

From : Department of Fish and Game

Subject: SCH 78091213 - Palo Verde-Devers 500 KV Transmission Line - Draft ES

The Palo Verde-Devers Transmission Line Draft Environmental Statement has been reviewed by our staff. The following comments are submitted for your consideration.

Combining this transmission corridor with other utility corridors would be an advantageous use of resources. The Kofa route north of Indio and within the San Jacinto Unit appears to be similar to a portion of the proposed Sundesert corridor. This route is preferable to the Brenda route because it does not pass through the Coachella fringetoed lizard habitat or the Palm Oasis of Indio Hills.

36-1 Our primary interest in a project of this nature is the extent to which various habitats will be made accessible to the public. As the Environmental Statement states, access and maintenance roads will provide entry routes into previously closed or limited access areas. These roads are expected to result in the reduction of habitat quality, the illegal taking of protected game and non-game species, and the disturbance of bighorn sheep lambing areas. Measures to reduce the public use of these roads should be thoroughly explored when specific corridor and road alignments have been agreed upon. The impacts of the transmission corridor itself on the desert biota will be severe and the addition of recreational pressure will compound the problem.

36-2 Basically the only mitigation offered along the California route involves the Coachella fringetoed lizard habitat. We believe that habitat losses through construction activities and road building should be mitigated either by land acquisition or by habitat improvement programs. The Chuckwalla Mountains support good wildlife but are limited by water availability in most areas. It may be advantageous to establish watering holes within the desert bighorn sheep's range as a mitigation feature. Department wildlife biologists would be available to discuss this alternative when specific corridors are selected.

36-3 The Department requests the project sponsor expand the bighorn sheep study to California and to include those wildlife species that will be most seriously affected by the transmission corridor. Also, it should be noted that the desert bighorn sheep has been given the status of "fully protected" by the State of California, not "rare" as the ES states.

Thank you for the opportunity to comment on this project. If you have any questions, please contact Robert D. Montgomery, Regional Manager of Region 5 at 350 Golden Shore, Long Beach, CA 90802. The telephone number is (213) 590-5113.

E C Fullerton

Director

Response:

36-1 See chapter 4, MITIGATING MEASURES.

36-2 See chapter 4, Wildlife.

36-3 Text and table 2-9 revised, see chapter 2 - WILDLIFE.

37

State of California — The Resources Agency

Memorandum

To: L. Frank Goodson
Projects Coordinator
The Resources Agency

U.S. Dept. of Interior
2400 Valley Bank Center
Phoenix, Arizona 85073

Date: October 4, 1978

From: Department of Conservation
Division of Mines and Geology
1416 - 9th Street, Sacramento 95814

Subject: Draft EIR Palo-Verde-Devers 500 KV Transmission Line, SCH 78091213

Geologic considerations which are lacking in this environmental document are as follows:

37-1

1. The potentials for an effect of liquefaction due to seismic shaking are not discussed in this EIR.

2. Mitigation measures should be discussed for liquefaction (if this is determined to be a hazard) as well as for the hazards of debris flows and sheet and rill erosion (as recognized on maps 2-5 and 3-3).

37-2

3. Among the applicants mitigation commitments, under the heading of "geotechnic considerations - soils" (page 1-32) is a statement regarding the sensitivity of wind erosion of the eluvial soils. It is not clear how the grading of access roads will be mitigatory since the removal of these soils by road grading would leave vulnerable exposures to the cut slopes.

4. The lesser vulnerability of the Kofa Route should be recognized, particularly with regard to surface rupture hazards.

Jerome Treiman

Jerome A. Treiman
Geologist

APPROVED:

James F. Davis
State Geologist

sr

APPROVED:

David Fox
Land Resource Protection Unit
DATE: 10-5-78

Response:

37-1 Potential impacts to the powerline from geological hazards such as seismic shaking, debris flow and flash flooding are recognized in chapters 2 and 3. However, since these are potential impacts of the environment on the transmission line rather than impacts to the environment resulting from construction of the transmission line, they can best be mitigated during engineering design of the structures by the applicant.

37-2 The remainder of the paragraph clarifies that proper design will reduce impacts below that which would occur with improper road design and grading.

38

alifornia THE RESOURCES AGENCY OF CALIFORNIA

Memorandum

To : L. Frank Goodson
Projects Coordinator
The Resources Agency

U.S. Dept. of Interior
2400 Valley Bank Center
Phoenix, Arizona, 85073

Date : September 11, 1978

Subject: Draft ES - Palo Verde-Devers 500 KV T/L

Telephone: ATSS ( )
( )

From : Department of Conservation — Special Services for Resource Protection

My review of this document in relation to the discussion of soils follows:

1. Page 2-10

   a. Water erosion rather than wind erosion is stated as the principal erosion agent and no further discussion of wind erosion ensues. Wind erosion is certainly as pervasive a problem in desert areas.

   b. Many wind erodible soils are located in the California sections of the proposed corridors (Report and General Soil Map of Riverside County).

   c. There is insufficient discussion of desert crusts and the erosion resistance afforded by such crusts.

2. Page 2-12 (Table 2-3)

38-1

   a. It is unclear what is meant by the column-erosion classes. Are these classes based on naturally occurring erosion rates or do they apply to accelerated rates after soil disturbance.

   b. It is unclear whether these erosion classes relate strictly to water erosion, wind erosion, or both.

3. Page 3-8

   a. Wind erosion is described as a major impact to soils by construction and subsequent abandonment. This does not agree with earlier neglect of wind erosion potential in the Description of the Environment section.

38-2

   b. The geotechnical sensitivity map (Map 3-3) does not include soil erosion. Further, a sensitivity map normally ranks sensitivities of the environment to impacts (e.g., high, medium, low, as is done on Map 3-4 entitled, "Vegetation Impacts"). Map 3-3 simply identifies geologic hazards.

38-3

   c. No discussion is made of the disturbance of pavemented desert soils (mainly Argids found on older, more dissected alluvial surfaces. Grading of dark, varnished pavements and subsequent deflation of vesicular silts will expose buff colored subsoils (argillic B horizons), resulting in a long-term impact to these old soils.

Ed Craddock
Land and Water Use Analyst
Soil Resource Protection Program

APPROVED: David Fox
Land Resource Protection

DATE: 10-5-78

Response:

38-1 The statement is accurate as written. See chapters 2 and 3. Soil Conservation Service (SCS) erosion guidelines were used, which take into account potential for both wind and water erosion. The text has been clarified in response to an earlier comment regarding erosion before and after disturbance.

38-2 Soils were excluded from map 3-3 because they are treated separately. A separate soil impact map was not deemed necessary, since erosion hazards are displayed on map 2-5.

38-3 Soil erosion in these areas is considered in chapter 2 - SOILS, and the long-term visual impact is treated under chapter 3 - VISUAL RESOURCE MANAGEMENT.

39

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
Sacramento Area Office
2800 Cottage Way
Sacramento, California 95825

IN REPLY REFER TO:
Land Operations

DEC 12 1978

Yuma District Office (050)
Bureau of Land Management
P. O. Box 5680
Yuma, Arizona 85364

Gentlemen:

As per our telephone conversation with Mr. Karl Kipping of your staff on December 8, we have reviewed the draft environmental impact statement on the proposed 500KV transmission line from Palo Verde, Arizona, to Devers, California.

The Agua Caliente Band of Indians is aware of the proposal but they have not taken a stand at this time. Ray L. Patencio, Chairman of the Agua Caliente Reservation, may be reached at P. O. Box 2245, Palm Springs, California 92262; Telephone No. (714) 325-5673.

Sincerely yours,

William E. Finale
Area Director

United States Department of the Interior

NATIONAL PARK SERVICE
JOSHUA TREE NATIONAL MONUMENT
74485 NATIONAL MONUMENT DRIVE
TWENTYNINE PALMS, CALIFORNIA 92277

IN REPLY REFER TO:

L3031

December 11, 1978

DEC 1978
RECEIVED
Yuma Dist. Office
BLM

Karl L. Kipping, Project Manager
Palo Verde-Devers ES Team
Bureau of Land Management
Yuma District Office
Post Office Box 5680
Yuma, Arizona 85364

Dear Mr. Kipping:

It is my understanding that in the Environmental Impact Statement covering the Palo Verde generating station there are no proposed electrical transmission corridors north of Interstate 10 in the vicinity of the southern-most boundaries of Joshua Tree National Monument. Therefore, the National Park Service, with regard to Joshua Tree National Monument, has no comment on the proposed routes identified.

Please find enclosed a copy of a position letter dated September 27th, 1977, from the Superintendent of Joshua Tree National Monument to yourself.

Sincerely,

Rick T. Anderson
Superintendent

Copy to: Mr. R. Buffington
State Director, BLM
Arizona

United States Department of the Interior
40
NATIONAL PARK SERVICE
JOSHUA TREE NATIONAL MONUMENT
74485 PALM VISTA DRIVE
TWENTYNINE PALMS, CALIFORNIA 92277

IN REPLY REFER TO:
L3031

September 27, 1977

Karl L. Kipping, Project Manager
Palo Verde-Devers ES Team
Bureau of Land Management
Yuma District Office
P. O. Box 5680
Yuma, Arizona 85364

Dear Mr. Kipping:

Thank you for your letter advising us of the Bureau of Land Management's responsibility regarding the Palo Verde Nuclear Generating Station. Moreover, we are pleased to have the opportunity to state our position with regard to the transmission lines proposed for that station.

The National Park Service is definitely concerned with the location of transmission lines in the vicinity of Joshua Tree National Monument. We have had the opportunity in the past to state this position on the Sundesert Nuclear Power Plant proposal and in the past on the Kaiparowits Fossil Fuel Plant. The position remains the same. The National Park Service is definitely opposed to any transmission lines being erected north of Interstate 10 on that corridor of land between the monument's southernmost boundary and Highway Interstate 10 in the vicinity of Chiriaco Summit. Transmission lines in this corridor would have a definite visual impact on all visitors entering the monument via our southern access road, which connects with Interstate 10. Also, these lines would be a prominent intrusion visible from numerous areas of the southernmost portion of the monument. Currently there is an existing pipeline and an acqueduct that is routed through this corridor, neither of which constitutes a significant visual impact. Additionally, the Southern California Edison transmission line that crosses approximately two miles of monument land in Sections 2, 3, and 4 of T.6S., R.12E., which was authorized by the Boulder Canyon Project Act of 1928, giving agencies receiving a contract for electric energy from the Boulder Canyon Project, authority to construct power lines across public lands. Those transmission lines, although very objectionable to the National Park Service are of relatively low silhouette as compared to the more recent proposed lines. Any transmission routes proposed south of Interstate 10 in the Chiriaco Summit area would have negligible visual impact on the monument visitor

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and therefore our position is that we would desire any such lines to remain south of the highway in the vicinity of our southernmost boundary. You should also be aware that remnants of General Patton's World War II training camp are just south of, and abutt our boundary in this area. This camp area apparently has been adjudged by some people to have historical significance, although we are unfamiliar with any particular studies of the site. Also, an air strip at Chiriaco Summit would definitely be impacted by transmission lines north of the highway.

Again, we thank you for your letter and the opportunity to respond. If there are any further questions or information that is necessary, please do not hesitate to call on us.

Sincerely yours,

Rick T. Anderson
Superintendent

41

United States Department of the Interior

BUREAU OF MINES

BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

Office of
Chief

Intermountain Field Operations Center

December 13, 1978

Your reference:
5100(911)
A9878

Memorandum

To: Arizona State Director (911), Bureau of Land Management, 2400 Valley Bank Center, Phoenix, Ariz. 85073

From: Acting Chief, Intermountain Field Operations Center

Subject: Draft Environmental Statement for the Proposed Palo Verde-Devers 500 kV Transmission Line, Arizona and California

The subject document--prepared by the Bureau of Land Management and the U.S. Nuclear Regulatory Commission--has been reviewed by personnel of this office as requested by Mr. Hal Pilkington of your district office in Yuma, Ariz., in a telephone conversation on December 8.

The project provides for the construction of a single-circuit 500 kV transmission line from the Palo Verde Nuclear Generating Station near Buckeye, Ariz., to the Southern California Edison Substation near Palm Springs, Calif. The length of the transmission line would vary between 235 and 265 miles, depending on the route selected.

The document gives excellent coverage of the mineral resources in the study area. The major metallic and nonmetallic minerals are listed in table 2-2, and the Land Use Areal Map 2-4 shows the location of the deposits. In addition, a map prepared by the U.S. Geological Survey (USGS) that shows supplemental minerals data is included in the appendix of the report; and a list of mineral localities by section, range, and township is given. Both active and potential mining areas were included in the USGS study. There are no known deposits of oil and gas or coal within the area.

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

We agree with the statement on page 3-8 that "Construction of the transmission line would have little impact on known mineral values or on current mining activity." We do, however, believe it is misleading to imply that the sand and gravel operations near Coachella Valley would be affected adversely if a certain one of the proposed corridors were selected. Our understanding is that none of the proposed transmission lines would have an adverse effect on the exploitation of mineral occurrences. In fact, the project conceivably could help mineral development by providing readily available electrical power.

41-1

We appreciate the opportunity to review an extremely well-prepared document.

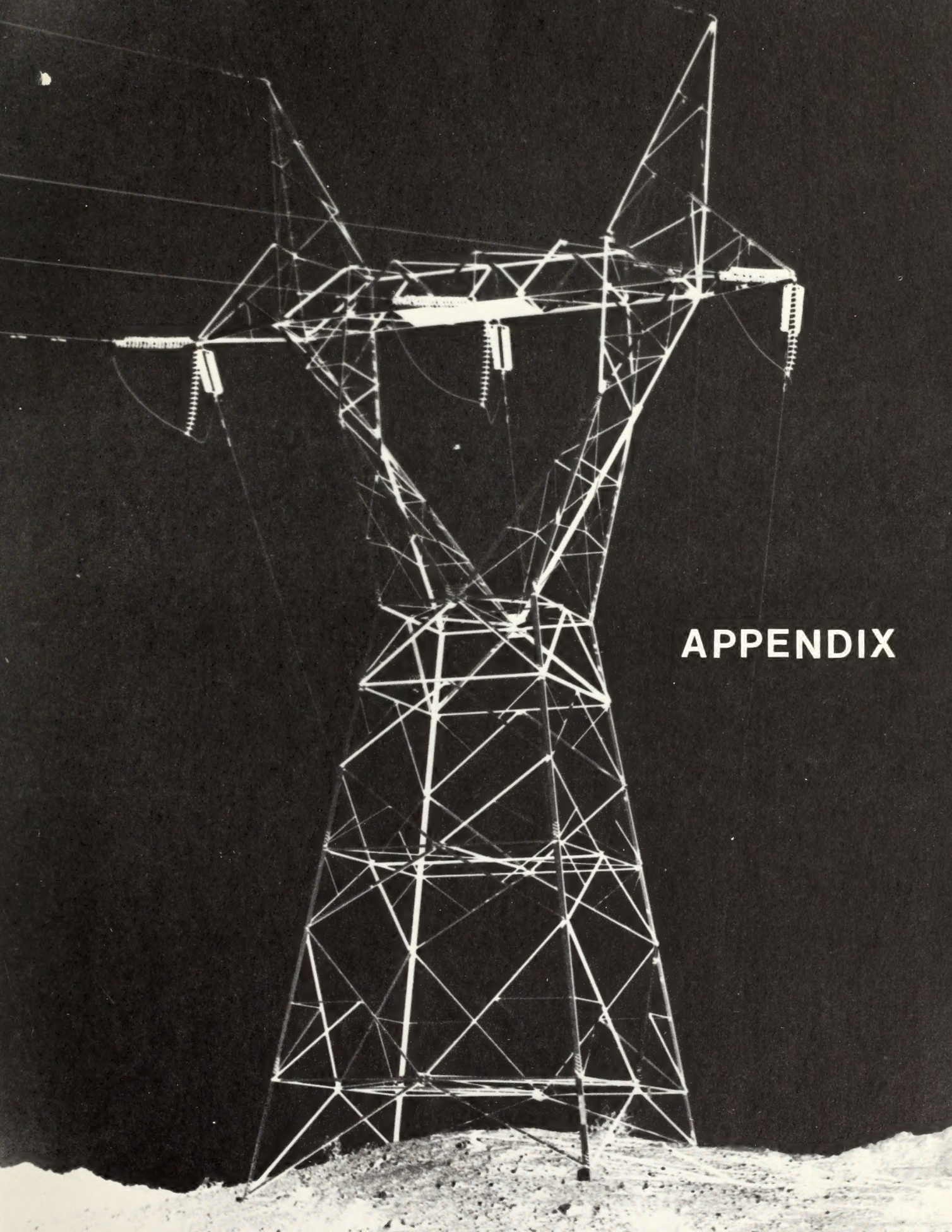
Russell R. McLellan

bcc: S. P. Wimpfen
W. L. Dare
J. C. Arundale
J. R. McWilliams
G. R. Leland

41

Response:

41-1 This statement recognizes potential impact to sand and gravel operations near Coachella Valley, not necessarily to imply negative impacts, but to recognize potential interaction between the industries.



APPENDIX

The following table contains:

1. The explanation of symbols used in the list of mineral localities.

2. The list of mineral localities by township and range.

Explanation of Symbols

A	Asbestos
Ag	Silver
AU	Gold
C	Clays
Cu	Copper
Fe	Iron
Fl	Fluorite
Gy	Gypsum, calcium sulfate
M	Mica
Mn	Manganese
Na 1	Federal property leased for sodium, 1977
Na 1 NP	Federal property leased for sodium, 1977, no production to date
P 1	Federal property leased for phosphate, 1977
R	Radioactive elements
S	Stone
Si	Silica
S, G	Sand and gravel
S, G 1	Federal property leased for sand and gravel, 1977
Sr	Strontium minerals
SS	Specialty sand
Wo	Wollastonite

Commodity	T	R	Meridian	Section	Active, Potential
S, G 1	10 N	19 W	G&S	33	A
S, G 1	9 N	20 W	G&S	12, 13	A
S (Perlite)	6 N	7 W	G&S	17	P
Sr	6 N	7 W	G&S	18, 19	P
P 1	6 N	18 W	G&S	1	A
Fl	5 N	8 W	G&S	17, 20	P
S (Marekanite)	5 N	8 W	G&S	30, 31 (approx.)	P, A
Mn	5 N	9 W	G&S	25, 26, 35, 36 (approx.)	P
Au, Ag	4 N	6 E	SB	21	P
S, G	4 N	12 E	SB	17	P
Au	3 N	9 E	SB	27	P
Au, Ag	2 N	4 E	SB	5	P
R	2 N	5 E	SB	4, 9	P
Na 1 NP?	2 N	17 E	SB	22-26	A
Na 1	2 N	17 E	SB	13, 19, 24-26	A
Na 1 NP	2 N	17 E	SB	17, 20, 21	A
R	1 N	8 E	SB	19, 20	P
Na 1 NP	1 N	18 E	SB	10, 11, 14, 15	A
Cu	1 N	21 E	SB	5	P
Fe	1 S	13 E	SB	20, 29	P
S (quartzite)	2 S	3 E	SB	36	A
S (ornamental)	2 S	3 E	SB	35, 36	P
M	2 S	3 E	SB	35, 36	P
S, G	2 S	4 E	SB	16	P
S, G	2 S	4 E	SB	13	P
S (limestone)	2 S	5 E	SB	8 (approx.)	P
Ag	2 S	5 E	SB	17	P
Au	2 S	12 E	SB	1	P
Au	2 S	20 E	SB	7	P
Gy	2 S	24 E	SB	6, 7	P
S (limestone)	3 S	3 E	SB	17	P
S	3 S	3 E	SB	35	P
S, G	3 S	4 E	SB	23	P
S, G	3 S	11 E	SB	11 (approx.)	P
SS	3 S	3 E	SB	23	P
Fe	3 S	13 E	SB	34, 35	P
Fe	3 S	14 E	SB	28, 29, 33-36	A
Si	3 S	14 E	SB	31-36 Proj.	P
Gy	3 S	18 E	SB	2, 3, 4, 9, 10, 11	p
Fe	3 S	20 E	SB	26	P
Gy	3 S	20 E	SB	35, 36	P

Commodity	T	R	Meridian	Section	Active, Potential
S, G	4 S	7 E	SB	35	A
Mn	4 S	19 E	SB	13, 24	P
Mn	4 S	20 E	SB	19	P
Gy	4 S	20 E	SB	1, 2, 3, 10	P
Gy	4 S	21 E	SB	5, 6, 7, 8	P
S (limestone)	4 S	22 E	SB	26, 27 (approx.)	P
Gy	4 S	22 E	SB	12, 18	P
Wo	4 S	22 E	SB	20, 21	P
S, G	5 S	7 E	SB	35	A
C	5 S	18 E	SB	30 (approx.)	P
S, G	5 S	22 E	SB	4, 5	A
S, G	5 S	23 E	SB	30	A
S, G	5 S	23 E	SB	32	A
Au	6 S	4 E	SB	29	P
S (limestone)	6 S	4 E	SB	27, 28, 34	P
A	6 S	5 E	SB	32 (approx.)	P
C	6 S	9 E	SB	21, 28 (approx.)	P
Fl	6 S	12 E	SB	25	P
R	6 S	14 E	SB	26	P
R	6 S	15 E	SB	1	P
R	6 S	20 E	SB	13, 14, 23, 24	P
R	6 S	21 E	SB	19	P
R	7 S	14 E	SB	1	P
S (perlite)	8 S	17 E	SB	23 (approx.)	P
S (gemstones)	8 S	20 E	SB	26, 27, 34, 35	P, A

FORMULA FOR CALCULATING SOIL LOSS FROM WATER EROSION

Normal soil erosion and sediment yield in desert soils expressed in acre-feet per square mile are multiplied by 20 (factor for increased erosion and sediment yield due to disturbance). The product is then multiplied by 1,850 tons of soil per acre-feet of soil. The final product indicates approximate losses to disturbed areas.

References: Erosion, Sediment and Related Salt Problems and Treatment Opportunities, SCS, Special Project Division, Golden, Colorado, 1975.

Thronson, Robert E., 1971. Control of Erosion and Sediment Resulting from Land Development and Highway Construction. Environmental Protection Agency, Washington, D.C.

APPENDIX

BACKGROUND CULTURAL RESOURCE MATERIALS
ON FILE AT THE YUMA BLM OFFICE

1. Prehistoric Overview of the Study Area.
2. Historic Overview of the Study Area.
3. Table 2-A. General Cultural Sequence for the American Southwest.
4. Table 2-B. Cultural Sequence for the Study Area.
5. Table 2-C. Cultural Resource Records Search Sources.
6. Table 2-D. Ethnographic Cultures of the Study Area.
7. Map 1. General Ethnographic Cultures within the Study Area.
8. Table 2-E. Summary of Cultural Resource Inventories along the Alternate Routes.
9. Map 2. Current Cultural Resource Status along the Alternate Routes.
10. Table 2-F. Definition of Archaeological Site Types Located within the Study Area.
11. Cultural Resource Field Inventory Methodologies.
12. Known Cultural Resources along the Alternate Routes.
13. Table 2-G. Current National Register and State Historic Landmark Properties.
14. Map 3. General Location of National Register and State Historic Landmark Properties Within the Study Area.
15. Criteria and Methodology Used to Develop Cultural Resource Sensitivity Levels.
16. Criteria and Methodology Used to Determine Cultural Resource Rating Levels.

* Titles not preceded by "Table" or "Map" are general narrative on that subject.

APPENDIX

RELATIVE RECREATIONAL IMPACT ANALYSIS*

Criteria	Impact Level and Score		
	High	Medium	Low
Recreation	4 - High recreational sensitivity determination	3 - Medium recreational sensitivity detertion	1 - Low recreational sensitivity determination
Distance to Recreation	0 - 0 - 1 mile -1 - if natural terrain blocks or reduces visibility	-2 - 1 to 3 miles -3 - if natural terrain blocks or reduces visibility	(-4) - (-5) - to 5+ miles
Recreation Opportunities	2- Does not conform to opportunities made available through recreational policies management activities, or plans of agency with jurisdiction.	0 Some or little (minor) impact regarding effects on recreational opportunities made available through agency with jurisdiction.	-1 - Conforms to recreational policies, management activities, or plans of agency with jurisdiction.
Overall Rating	5 - 6 = High	1 - 4 = Medium	0 - (-1) = Low

* Adopted from Sundesert E.S.

APPENDIX

RECREATIONAL-SENSITIVITY DETERMINATION[a]*

Sensitivity Level Criteria and Score

Factors	High	Medium	Low
Values	Score "4" for presence of BOR Classes IV (Outstanding Natural Area), V (Primitive Area), and VI Cultural and Historic Sites). All protectively managed areas including closed ORV areas, National Parks and Monuments, State Parks, and Wilderness Areas.	Score "3" for BOR Class III (Natural Environment Areas). Areas recognized such as Candidate Natural Areas, and areas managed for multiple uses such as National Forests. Certain large County Parks where natural environment predominates.	Score "2" for BOR Classes I and II (General Outdoor Recreation Areas). Regional parks that are intensively managed with special facili- for sports, areas of turf and predominantly exotic vegetation.
Use Intensity	Score "3" for heavy to intense (more than 193.0 annual visitor-use days[b] per km^2 or 500 annual VUD's per square mile).	Score "2" for Medium (9.7 -193.0 annual VUD's per km^2 or 24-500 annual VUD's per square mile).	Score "1" for Low (fewer than 9.6 annual VUD's per km^2 or 25 annual VUD's per square mile).
Opportunities	Score "3" for activities that are primarily land-oriented (i.e., hiking, camping, picnicking). Recreational use has Low potential for consuming or altering inherent values. Management favors a wide variety of activities with a minimum of facility development and Low potential for conflict among recreation users.	Score "1" or "2" for activities that are primarily consumptive (i.e., ORV, hunting, rock-hounding). Recreational use has Low potential for altering inherent values. Management favors one or a few activities with special facilities or land-use designations and High potential for conflict among various recreation users.	Score "0" for vehicle-oriented opportunities that are limited and/or restricted due to lack of public access as a result of private land holdings, or public but restricted such as military reservations.

[a] Overall recreational sensitivity for any specific area was determined by adding the approximate scores matrix and comparing them with the ratings: 8-10 = High, 4-7 = Medium, and 1-3 = Low

[b] Visitor-use day (VUD): One visitor for an aggregate of 12 hours of use.

* Adopted from Sundesert ES.

SOUTHERN CALIFORNIA EDISON COMPANY
SUMMARY OF 1977 CONSERVATION PROGRAMS

In 1977 the Southern California Edison Company conducted more than 50 conservation and load management programs. The objective of Edison's conservation/load management efforts was to increase efficiency of electricity usage, cut energy waste and moderate system peak demand.

Edison's continued conservation effort, and the customers commitment to the conservation ethic resulted in an annualized savings of 585.7 million kilowatthours. The Company's Voltage Reduction Program resulted in the realization of an additional savings of 220 million kilowatthours in 1977.

Following is a recap of Edison's 1977 Conservation and Load Management programs. It is anticipated that all programs will continue through 1978.

RESIDENTIAL CONSERVATION PROGRAMS

The first seven programs described were implemented during the year; the remaining programs were in the development stage.

1. Energy Conservation Kit for New Residential Customers

This program is directed toward Edison's approximately 1 million residential customers who request electric service annually. Customers requesting service are mailed a kit of information containing ideas on how to conserve electricity in the home. In 1977, Edison mailed 849,100 new customer kits; the resultant estimated annualized energy savings was 5,264,420 KWH.

2. Sure Action for Valuable Energy Savings (SAVES)

SAVES is a very unique residential program. The SAVES Program takes a personalized approach, utilizing a computer and a questionnaire, to suggest specific conservation measures that can be taken in the household. As of December 31, 1977, 244,300 responses had been received representing 9 percent of our residential customers. The estimated annualized energy saving was 41,097,000 KWH.

3. Sherlock Homes Program (High Use)

Edison has identified approximately 200,000 high use residential customers. Nine thousand of these customers use 30,000 KWH or more per year. "SHERLOCK" is a residential energy audit program that is conducted

by Edison's Customer Service Consultants for these identified high use customers. The program became fully operational October 1, 1977; the reported savings for 1977 was 4,113,000 KWH.

4. Home Insulation Program

In 1977, Edison offered a home insulation program to residential customers in the cities of Barstow, Victorville, and Long Beach. These areas were selected in order to avoid duplicating the efforts of the Southern California Gas Company. Edison acts as the primary contractor for home insulation and subcontracts the installation to qualified, licensed contractors. This program is currently being revised as a consequence of a recent CPUC order concerning utility implementation of home insulation assistance and financing provisions.

5. Electric Water Heating Conservation Program

Edison has approximately 270,000 residential customers that have electric water heaters. In order to reduce the amount of hot water consumed by these customers, Edison offered a free shower flow device. During the year, 1,729 were distributed to customers which effectuated an estimated energy savings of 225,000 KWH.

6. Consumer Education Program

The Consumer Education Program augments Edison's public awareness efforts by utilizing highly trained Consumer Service Consultants to communicate on a face to face basis with these group of residential customers. During 1977, the Consumer Services Consultants conducted 2,842 direct audience programs that were attended by more than 119,000 Edison customers. Their presentations covered a variety of conservation subjects. Based on an Edison survey of program attendees, an annualized savings of 29,777,000 KWH was achieved.

7. Solar Water Heating Demonstration/Publicity Program

The objective of this program is to stimulate public interest and acceptance of solar energy as a viable method of providing hot water and conserving energy. The program is directed toward the new residential construction market; the goal is to install 1,250 solar assisted water heating systems.

8. Solar Retrofit/Electric Water Heater Program

The solar retrofit program is directed toward a market of 1,000 Edison residential customers occupying single family dwellings and

condominiums that have electric water heaters. The program objective is to conserve energy and reduce system peak demand.

9. Energy Marts

Edison plans to open its first consumer conservation product and information center "Energy Mart" in May 1978. The "Energy Mart" will be located in a major regional shopping center, and will be operated by a team of conservation consultants. Industry will participate in supplying product displays and information. A reference library will be maintained to assist the do-it-yourselfer. If the initial effort is successful, a total of six centers will be established throughout the Edison territory.

10. Hy Efficiency

This energy savings appliance program encourages consumers to purchase refrigerators, refrigerator/freezers or room air conditioners that meet or exceed the 1979 California Efficiency Standards. Under direction of Edison, the Electrical Industries Association will be utilized to administer the program. It is estimated that the purchase of high efficiency appliances will result in a permanent annualized reduction of approximately 2,500,000 KWH.

11. Wrap Up

"Wrap Up" is an electric water heater insulation program developed to reduce water heater heat loss and energy consumption. The objective is to wrap approximately 27,000 domestic water heaters annually and to reduce energy consumption by an estimated 11,500,000 KW on an annualized basis.

NONRESIDENTIAL CONSERVATION PROGRAMS

During 1977, the first four nonresidential conservation programs listed below were implemented and the remaining five were in various stages of development.

1. Commercial/Industrial and Public Authority Audits

The focus of this program is Edison's commercial/industrial and public authority customers whose demands exceed 200 KW. Forty-four full-time Energy Services Representatives maintain close contact with the subject customers in an effort to assist them in identifying wasteful applications of energy and stimulating their interest in demand deferral. The 1977 estimated annualized energy savings resulting from audits from these customers was 399,698,000 KWH.

2. Commercial Customer Contact Program

Edison has approximately 82,000 commercial/industrial customers whose demands range from 20 to 200 KW. Energy Services Representatives personally contact these customers to encourage and assist them implement conservation and load management techniques, practices and procedures. The estimated annualized saving for the Small Energy Audit program in 1977 was 90,736,000 KWH.

3. Agricultural and Water Customer Contact and Water Utility Pump Test Programs

Edison has been conducting free hydraulic pump efficiency tests to the subject customers for more than 50 years. Past experience shows that through pump modification and pump efficiency testing, a significant amount of energy saving results. As a result of improved pump efficiencies during 1977, it is estimated that an annualized savings of 14,587,000 KWH was achieved.

4. Specifier/New Construction and Multiple Account Contact Program

New Construction - Edison consultants contact architects and their design colleagues to encourage the inclusion of conservation/load management hardware and techniques over and above current recommended guidelines in written specifications for new projects.

Multiple Accounts - Due to the phenomenal growth of retail chain operations and multiple account operations, many opportunities exist to contact individuals at the central decision making level to encourage installation of energy efficient building systems, and to reduce lighting levels, and introduce load management functions that are beneficial and cost effective.

5. Commercial/Industrial New Customer Kit

Edison receives approximately 70,000 new service requests annually. Commercial/industrial service requests provide Edison with an opportunity to mail the customer a kit containing information regarding the need for conservation and load management and specific energy management suggestions for electrical end-use equipment.

6. "Operation Egg Plant" - Agricultural Lighting Program

Energy Services Representatives will contact agricultural customers, i.e., egg ranches and plant propagators who have extensive lighting requirements. Ths goal of the program is to encourage a reduction in

lighting usage and/or the installation of more efficient lighting systems thereby reducing the annual consumption of electricity in the agricultural sector by 4,500,000 KWH.

7. "Fresh and Free" - Commercial/Industry Economy Cycle Retrofit

Fresh and Free is directed toward those commercial/industrial customers whose hours of operation and air conditioning load requirements are conducive to the utilization of economy cycle controls. The objective is to reduce, by 5 million kilowatthours, the annual energy used in commercial/industrial air conditioning systems.

8. "Lumen Lessen" - Commercial/Industrial Conservation Program

This conservation campaign is designed to inform commercial/industrial customers of recent technological improvements in the lighting field. Energy Services Representatives will offer to help commercial/industrial customers review their proposed lighting system with a goal of reducing by 14,000,000 KWH the annual consumption of energy in both existing and new construction commercial/industrial market segments.

9. "Watt Stopper" Commercial/Industrial Time Clock Control Program

Edison established plans to conduct a time clock control campaign designed for those commercial/industrial customers identified as having a potential to utilize time clock controls. Energy Service Representatives will review energy audit records and subsequently recontact those customers having potential for controlling equipment with time clocks. At the time of contact the Energy Services Representative will provide the customer with a rough estimate of costs and benefits to be derived from the installation of time clocks.

LOAD MANAGEMENT PROGRAMS

Load Control Studies

The objective is to test numerous load-limiting techniques and/or devices and to determine the type of loads available for permanent control, KW demand that can be deferred or reduced, and customer acceptance of permanent control either customer or utility imposed.

In 1977, Edison implemented the following activities:

1. Domestic Air Conditioning Load Research Study
2. Residential Water Heating Load Control Equipment
3. Residential Load Control (Automatic Powershift)
4. Energy Economizer (Residential)
5. Commercial/Industrial Air Conditioning Load Control

COGENERATION

By definition, parallel generation is the operation of a retail customer generator while connected to the Edison system. Parallel generation includes cogeneration which is the recovery by Edison and/or one of its customers waste energy from one process, and its utilization in a second process, which includes the generation of electrical energy.

Edison greatly accelerated its cogeneration efforts in 1977 in market development, project coordination, draft agreements, studies, and the establishment of negotiation procedures.

In 1977, 39 customers with a net cogeneration potential of 612 MW were identified. Numerous cogeneration markets were analyzed and tested.

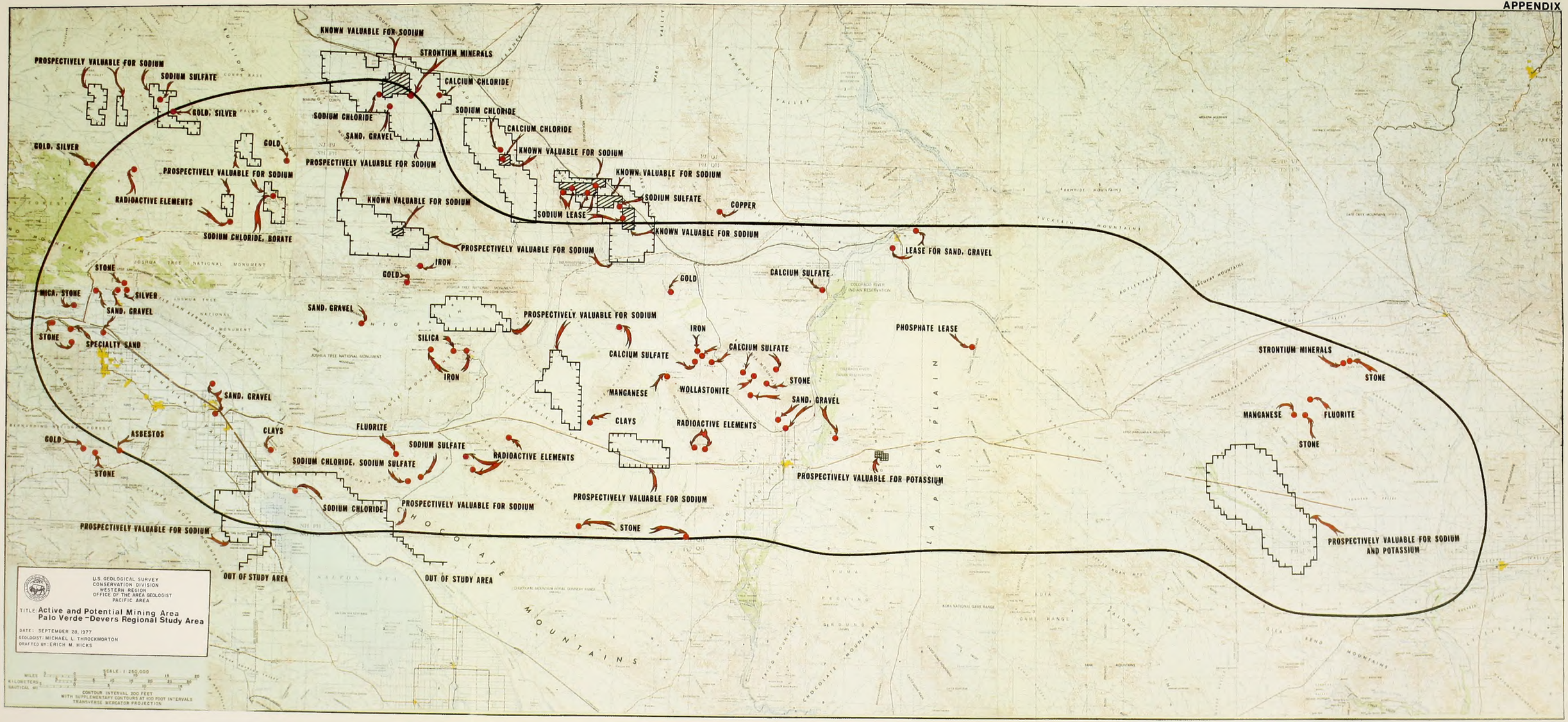
PUBLIC AWARENESS

Edison is involved in attitude research as it relates to conservation and load management. The results indicate a substantial need for intensified public awareness activities to present energy management information. The objectives of Edison's Public Awareness program are to create public receptivity of specific energy management strategies; to educate individual consumers on the effects their actions have on electricity demand; to stimulate public awareness of conservation and load management ethics, techniques and needs; and to reduce system on-peak demand. Examples of the diversified activities utilized by Edison to stimulate public awareness are speeches, brochures and booklets, displays, exhibits, print and broadcast advertisements, newspaper columns, specialized newsletters, workshops, seminars and forums.

CONSERVATION/LOAD MANAGEMENT STUDIES

Engineering Studies

The objective is to develop and evaluate conservation/load management techniques, products, and processes for the residential, commercial/industrial, and agricultural sectors. In 1977, research and analysis was performed in areas such as thermal storage, high rise building heat recovery, solar-assisted heat pump, farm irrigation efficiency improvement, high efficiency motors, lighting, aerial thermal scan and commercial load control program.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COLORADO RIVER INDIAN RESERVATION
CHOCOLATE MOUNTAINS
LA POSA PLAIN
YUMA PROVING GROUND
KOFA NATIONAL GAME RANGE
U.S. GEOLOGICAL SURVEY
CONSERVATION DIVISION
WESTERN REGION
OFFICE OF THE AREA GEOLOGIST
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TITLE: Active and Potential Mining Area
Palo Verde–Devers Regional Study Area
DATE: SEPTEMBER 28, 1977
GEOLOGIST: MICHAEL L. THROCKMORTON
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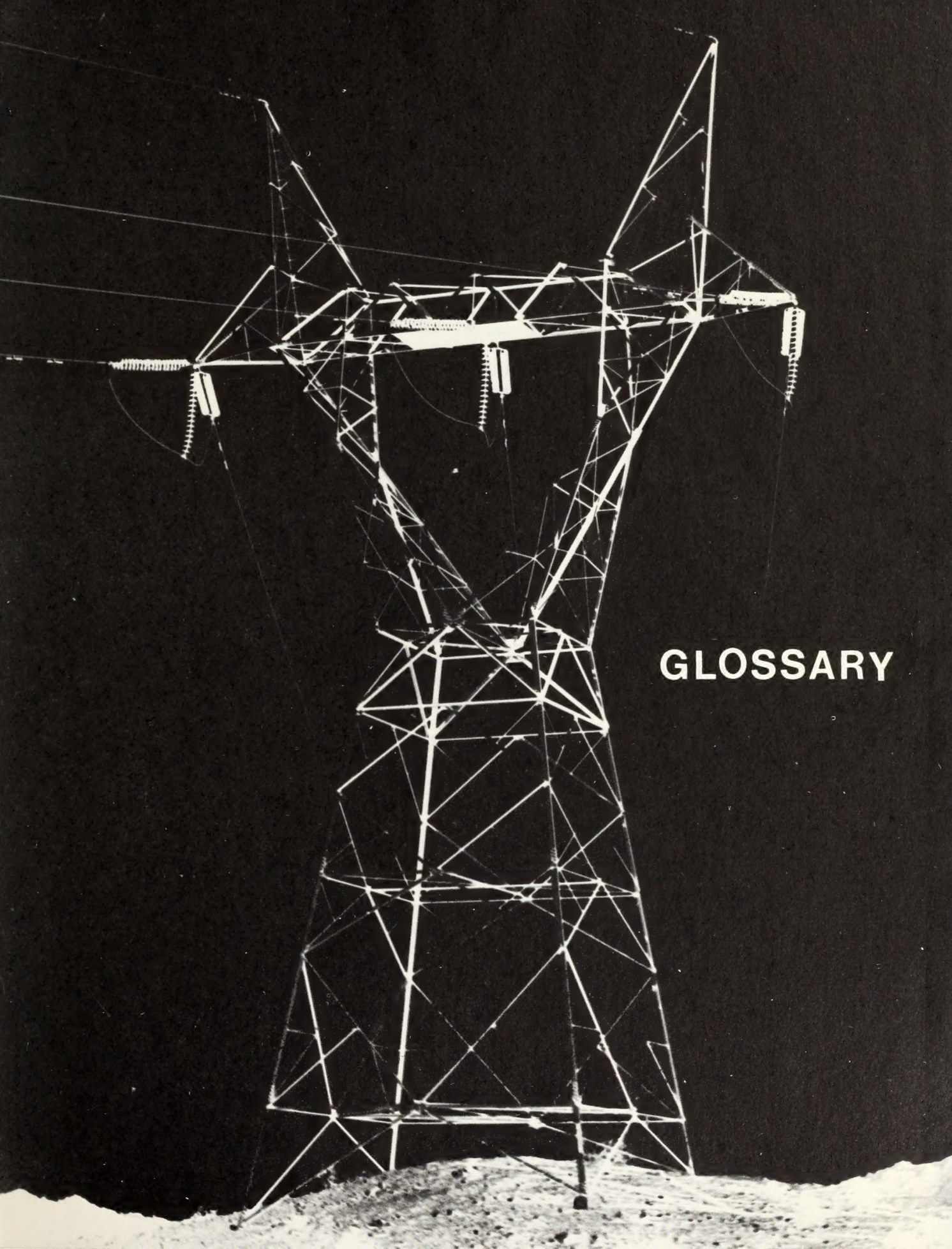


GLOSSARY

GLOSSARY

acre-foot -	The amount of water necessary to cover 1 acre to a depth of 1 foot, equaling 43,560 cubic feet.
agrarian -	Of, relating to, or characteristic of the farmer or his way of life.
alignment -	The specific, surveyed route of a transmission line.
alluvial fans -	A fan-shaped deposit of sand, gravel and fine material from a stream where gradient lessens abruptly.
alluvial -	Pertaining to geologic deposits, generally unconsolidated, laid down by a river or stream.
alluvium -	A general term for all detrital deposits resulting from the operations of modern rivers, thus including the sediments laid down in river beds, flood plains, lakes, fans, at the foot of mountain slopes and estuaries.
animal unit month -	Volume of forage or feed required to sustain an animal unit (one cow and a calf or five sheep) for a period of 30 days.
areal -	A particular extent of space or surface serving a special function.
argids -	Aridisols soils that have a horizon in which clay has accumulated with or without alkali (sodium).
argillic horizon -	An argillic horizon is an illuvial horizon in which layer-lattice silicate clays have accumulated by illuviation to a significant extent.

aridisols - Soils that have pedogenic horizons and are low in organic matter and are never moist as long as 3 consecutive months.

Arizona upland - Mountainous areas within the Sonoran Desert.

background - That portion of the visual landscape lying from the middleground limits out to infinity. Color and texture are subdued in these areas; primarily concerned with the two dimensional shape of landforms against the sky.

badland - This miscellaneous land type consists of excessively drained, very shallow soil developed on conglomerates, soft sandstone, shale and other nonmarine sediments.

bajada - Outwash slope of erosional material deposited at the base of each mountain range by water rushing down the slopes after torrential summer rains.

base line - In cadastral survey a line which runs in an east-west direction from an initial point.

bed load - Soil, rock particles, or other debris rolled along the bottom of a stream by the moving water.

bedrock - Solid rock exposed at the surface of the earth or overlain by unconsolidated material.

borrow areas - An area of soil removal.

calcic horizon - The calcic is a horizon of accumulated calcium carbonates and/or calcium and magnesium carbonates.

cambic horizon - The cambic is an altered horizon in which the texture of the fine-earth fraction is a very fine sand or loamy fine sand or finer. Physical and chemical alterations have occurred in this horizon.

capital-intensive production - Production (agricultural) requiring significant dollar investment to maximize output.

carbon monoxide - A colorless, odorless, toxic gas produced by incomplete fuel combustion, primarily emitted by motor vehicles.

centimeter - Metric unit of length, 0.01 meter or approximately 0.39 inch.

circuit - A complete closed conducting path over which electric current may flow.

community - A group of one or more populations of organisms which form a distinct ecological unit. Such a unit may be defined in terms of plants, animals or both.

conductor - A material, usually in the form of a wire or cable, suitable for carrying an electric current.

congruence - The state of agreeing or coinciding.

consolidated - Hard or firm.

corona free - Lack of audible or visual discharge of electrical ions from electrical conductors or insulators.

critical habitat - The necessary environmental conditions that are vital to sustain a specific animal population.

cultural resources - Objects, structures, sites and districts that pertain to native peoples or other communities; they are generally classified as either historic or prehistoric (archaeologic). Such areas are of importance because of their educational, interpretative and/or scientific value, because they are vital to the preservation of a subculture, or because they are representative examples.

demographic - Of, or relating to the statistical study of human populations with reference to size, density, distribution and vital statistics.

desert pavement - A nearly flat desert soil surface consisting of a thin layer of pebbles which are covered with dark-brown varnish or iron and manganese oxides.

double circuit - Two electrical circuits strung through a single tower structure.

duripan - The duripan is a subsurface horizon that is cemented by silica to the degree that fragments from the air-dry horizon do not slake in hydrochloric acid. Duripan varies in the degree of cementation by silica, and commonly contains accessory cements, chiefly iron oxides and calcium carbonates.

ecological sensitivity - A rating given to an area based on factors such as, rarity of plants and animals, density of plants and animals and diversity of plant and animal species.

ecosystem - Any community of organisms along with its environment, forming an interacting system.

eluvial - Internal movement of soil colloids, minerals, etc., due to water movement in the soil profile.

endangered - A plant or animal in immediate danger of being completely eliminated.

entisols - Soils that have no pedogenic horizon.

environment - All that surrounds an organism and interacts with it.

eolian - Also may be spelled aeolian; applied to deposits arranged by the wind, wind blown.

ethnography - Descriptive anthropology.

ethnology - A science that deals with the division of mankind into races and their origin, distribution, relations, and characteristics.

fan deposits - An accumulation of debris deposited by a stream in the shape of a fan.

fault - A fracture or fracture zone along which there has been displacement of the sides relative to one another.

fauna - All animal life.

flood plain - That portion of a river valley, adjacent to the river channel, which is built of sediments during the present regime of the stream and which is covered with water when the river overflows its banks at flood stages.

flora - All vegetative life.

fluvents - Entisols that have organic matter that decreases irregularly with depth; formed in loamy or clayey deposits.

fluvial - Pertaining to rivers; produced by river action.

foreground - That portion of the visual landscape lying generally from one-quarter to 1-mile beyond the viewer. Details of humansize features are visible at this distance, and all features are large scale elements.

geopolitical - Of, relating to, or based upon the combination of political and geographic factors characterizing a particular region.

groundwater - That part of subsurface water that completely saturates the rocks and is under hydrostatic pressure.

guy - A strand used to balance the horizontal forces on a pole or tower.

habitat - The environmental factors of the particular area where a plant or animal lives.

hectare - Metric unit of area, 10,000 square meters or approximately 2.47 acres.

helix - Spiral in form or action.

homogeneity - The state of having uniform distribution of values or characteristics.

horizon - A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes.

hydrocompaction - Hydrocompaction occurs when chemical and physical bonds in a soil profile are weakened by water initially entering low density soils. The soil may collapse when this occurs.

igneous - Formed by solidification from a molten or partially molten state.

illuviation - The accumulation of soil colloids and minerals removed from one horizon to another in the soil.

indicator plant - A plant whose presence or abundance indicates the presence of certain environmental conditions.

indurated sedimentary - Rocks hardened by heat, pressure, or cementation.

insulator - A device that is resistant to the conduction of electricity used for isolating and supporting conductors.

intaglio - An engraving or incised figure in stone or other hard material depressed below the surface of the material so that an impression from the design yields an image in relief.

intertie - A transmission line linkage joining two or more load systems or utility systems through which power produced by one can be utilized by the other.

kilometer - Metric unit of length, 1,000 meters or approximately 109.36 yards.

kilovolt - 1,000 volts (a volt is a measure of electrical potential difference which will cause a current of 1 ampere to flow through a conductor whose resistance is 1 ohm).

megawatts - 1,000 kilowatts or 1 million watts (a watt is a unit of electrical power equal to 1/756th horsepower).

metamorphic - Refers to rocks which are altered due to changes in pressure and temperature, or the introduction of new chemical substances. These rocks are generally altered below zones of weathering and cementation.

meter - Metric unit of length, approximately 39.37 inches.

natural area - An area set aside for study as an example of present, natural conditions.

nitrogen dioxide - Nitrogen dioxide is a gas produced as the result of combustion of gases. Among the major sources of nitrogen dioxide are motor vehicles, electric power plants and explosives manufacturing industries.

one hundred year flood (100-year flood) - A flood with a magnitude which may occur once every 100 years; a 1-in-100 chance of a certain area being inundated during any year.

orthents - Loamy or clayey entisols that have a regular decrease in organic matter content with depth.

orthids - Aridisols that have accumulations of calcium carbonates, gypsum, or other salts more soluble than gypsum and having no horizon of accumulation of clay. Orthids may have horizons from which some materials have been removed or altered.

oxidants - Oxygen-containing compounds that are formed by the reaction of hydrocarbons with nitrogen oxides in the atmosphere. Since sunlight promotes this reaction, it is referred to as the photochemical reaction and the compounds formed are referred to as photochemical oxidants or "smog". The principal oxidant is ozone, a colorless, pungent toxic gas. Some oxidants are in the form of aerosols which reduce visibility and cause eye irritation and breathing difficulty.

particulates - Particles of solid and liquid matter dispersed in the atmosphere. Examples of particulates include dust, smoke, soot, mist, fumes, and fog. The smaller particles, commonly called aerosols, reduce visibility. Sources of particulates include fuel combustion, industrial processes, incineration, agriculture, and fugitive sources such as unpaved roads and vacant lots.

permeability - Capacity for transmitting fluid.

petrocalcic horizon - The petrocalcic horizon is a continuous, cemented, or indurated calcic horizon that is cemented by calcium carbonates or in some places by calcium and magnesium carbonates. Accessory silica may be present.

petroglyph - A carving or inscription on rock.

physiographic province - Region of similar structure and climate, and landforming history.

placer deposits - A mass of gravel, sand or similar material resulting from the crumbling and erosion of solid rocks and possibly containing particles of gold or other valuable minerals that have migrated from lodes or veins.

plate boundary - This term refers to the theory of Plate Tectonics where the crust of the earth is divided or broken up into plates separated by rift zones, subduction zones or transform faults.

playa - The flat-floored bottom of an undrained desert basin that becomes at times a shallow lake.

plio-pleistocene - Strata transitional across the Pliocene-Pleistocene boundary; generally representing alluvial deposits 1-2 million years old.

precambrian - Rock generally older than 600 million years, and believed to be some of the oldest on earth.

psamments - Entisols that have textures of loamy fine sand or coarser.

public land - Land owned by the Federal government and administered by the Bureau of Land Management without regard to how the United States acquired ownership.

raptor - A bird of prey, such as an eagle or hawk.

rare - A plant or animal restricted in distribution. May be locally abundant in a limited area or few in number over a wide area.

recent - Very young; representing time and strata younger than Pleistocene.

richter magnitude - A logarithmic quantity characteristic of the total energy released by an earthquake.

riparian - Vegetation bordering water courses, lakes or swamps; this vegetational type requires a high water table.

rockland - Land wherein more than 90 percent of the surface is exposed bedrock.

seismicity - Earth vibrations or earthquake activity.

sheet flow - Water descending in sheets.

shunt reactor - An electrical circuit to divert electricity.

soil collapse - Soil collapse is caused by overloading loamy or silty soils with heavy equipment. Soil particles are compressed; thus reducing the air-water pore space relationship.

soil order - The highest level in soil classification. Soil orders are differentiated primarily by the presence or absence of diagnostic horizons.

soil profile - The soil profile is an abstract as exposed in a cut or section. It includes the collection of all the genetic horizons, the natural organic layers on the surface, and the parent material or other layers beneath the solum.

stipulation - A condition, requirement or item specified in a right-of-way grant.

strain adjustment - Adjustment to deformation resulting from applied force.

suborder - The second highest level in soil classification. Suborders in a soil delineates the soil properties common to the order and other properties used in identification.

substation - A facility in an electrical transmission system with the capability to route and control electrical power, and to transform power to a higher or lower voltage.

threatened - A plant or animal in danger of being eliminated in the foreseeable future.

topography - The relief and contour of the land.

transition zone - A mixture of plant types or conditions between adjoining types.

unique areas - A distinct unit of desert which contains certain species or conditions not found elsewhere.

utility corridor - A common route used by more than one utility for transportation.

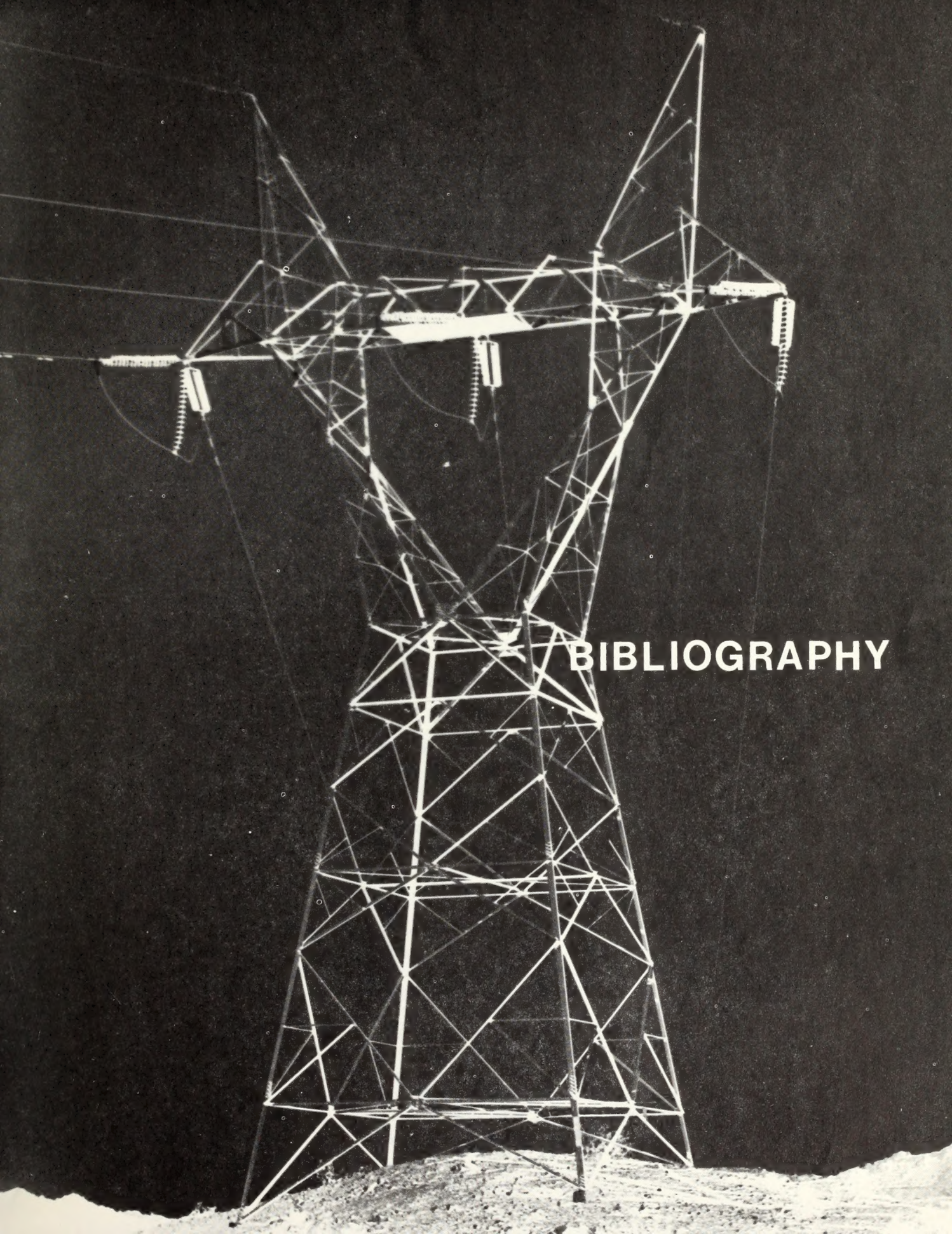
wildlife covert - A group of plants that provide protective cover for one or more species of wildlife.

ABBREVIATIONS AND ACRONYMS

ac	Alternating Current
adt	Average Daily Traffic
APS	Arizona Public Service
AUM	Animal Unit Month
BLM	Bureau of Land Management
C	Celsius
CALTRANS	California Department of Transportation
CCD	Census County Division
cm	Centimeter
cr	Contrast Ratings
DES	Draft Environmental Statement
EPA	Environmenal Protection Agency
EPG	El Paso Natural Gas Company
ES	Environmental Statement
F	Fahrenheit
FWS	Fish and Wildlife Service (U.S. Department of the Interior)
ha	Hectare
IID	Imperial Irrigation District
km	Kilometer
kV	Kilovolt
KGRA	Known Geothermal Resource Area
LADWP	Los Angeles Department of Water and Power
m	Meter
Mg	Megagram
MW	Megawatts
MWD	Metropolitan Water District
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NRC	U.S. Nuclear Regulatory Commission

ABBREVIATIONS AND ACRONYMS (Cont'd)

ORV	Off-Road Vehicle
PVDES	Palo Verde-Devers Environmental Statement
PVNGS	Palo Verde Nuclear Generating Station
PWSA	Proposed Wilderness Study Area
rem	Roentgen Equivalent Man
RIS	Recreation Information System
SCE	Southern California Edison Company
SCG	Southern California Gas Company
SCS	Soil Conservation Service (U.S. Department of Agriculture)
SDG&E	San Diego Gas and Electric Company
SHPO	State Historic Preservation Officer
SOHIO	SOHIO Transportation Company
SRP	Salt River Project
USBR	U.S. Bureau of Reclamation
USDI	U.S. Department of the Interior
USGS	U.S. Geological Survey
VORTAC) VOR	Very High Frequency Omni Range
) TAC	Tactical Air Navigational System
VRM	Visual Resource Management
WSA	Wilderness Study Area
WSCC	Western States Coordinating Council
YPG	Yuma Proving Ground



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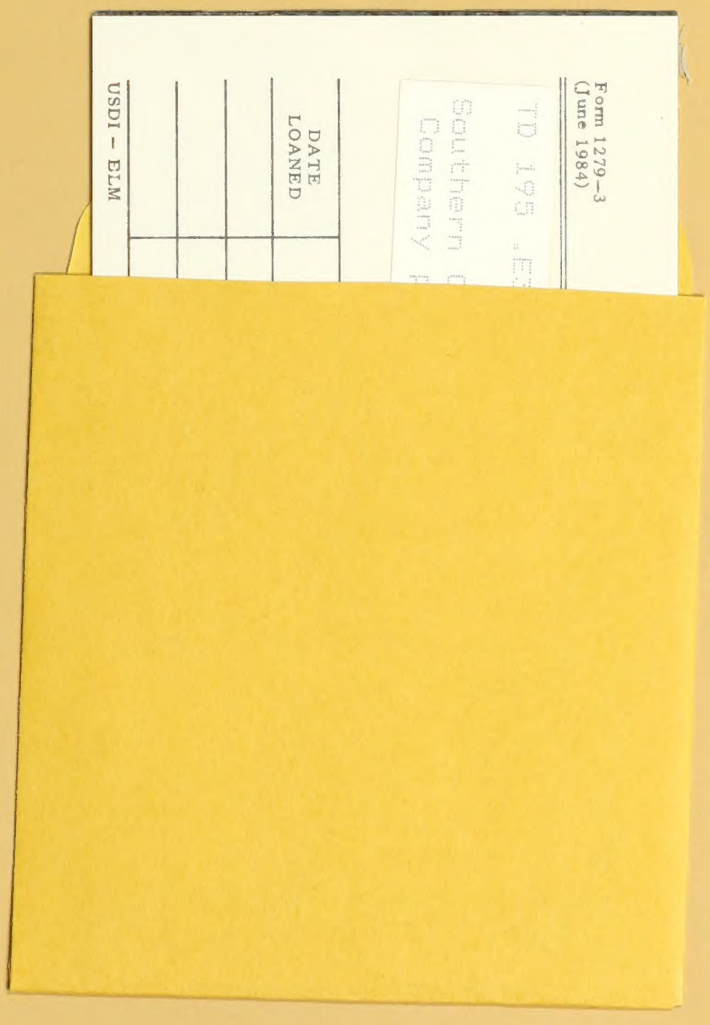
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